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ANNUAL REPORT

OF THE

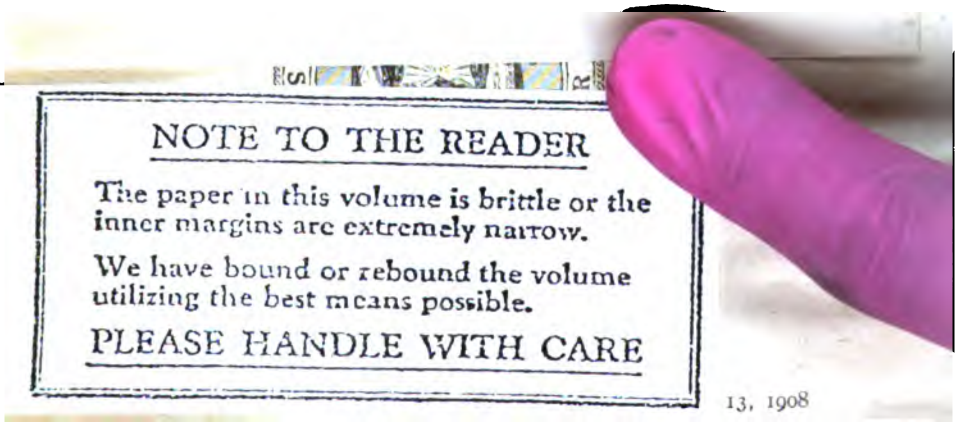
State Engineer and Surveyor

OF THE

COMPLIMENTS OF

Frank M. Williams

State Engineer and Surveyor.



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1908

ANNUAL REPORT

OF THE

State Engineer and Surveyor

OF THE

STATE OF NEW YORK

For the Fiscal Year Ending September 30, 1907

TRANSMITTED TO THE LEGISLATURE JANUARY 13, 1908

ALBANY
J. B. LYON COMPANY, STATE PRINTERS
1908

STATE OF NEW YORK

No. 15.

IN ASSEMBLY

January 13, 1908.

ANNUAL REPORT
OF THE
STATE ENGINEER AND SURVEYOR
OF THE
STATE OF NEW YORK

Office of the State Engineer and Surveyor,
Albany, N. Y., *January* 13, 1908.

To the Honorable the Speaker of the Assembly:

Sir.— I have the honor to transmit herewith my annual report for the fiscal year ending September 30, 1907.

Very truly yours,
FREDERICK SKENE,
State Engineer and Surveyor.

197160

REPORT.

To the Honorable the Legislature of the State of New York:

I have the honor to present herewith my first annual report as State Engineer and Surveyor of New York.

The State Engineer and Surveyor is charged with many duties by the provisions of the Constitution of the State, by the Revised Statutes and by the laws that are passed at each session of the Legislature. This report gives in detail the manner in which this Department has carried out these duties, which are constantly increasing in variety and extent. In general the State Engineer and Surveyor is charged with the duty of designing and supervising the various engineering operations needed in the construction and maintenance of the State public works, which have grown to large proportions within the last few years.

From the organization of his Department in 1848 to the present time, the chief duty of the State Engineer and Surveyor has been to direct the making of surveys, maps, plans, specifications and estimates of cost for works of construction or improvement upon the canals of the State, and to supervise these works of construction, improvement or repair. Since 1898 a new form of public works — improvement of the State's highways — has come under his supervision, and this undertaking has now grown to such proportions that it about equally divides his attention with the work of enlarging and modernizing the canals — an enterprise of a magnitude greater than any state has heretofore attempted. For this work of improving the highways the State Engineer and Surveyor makes the surveys and plans, advertises and awards the contracts and has entire charge of construction, while in progress, and of maintenance, after the highways have been improved and turned over to the counties. He also has a supervising control over the repair and maintenance of highways in towns that have adopted the money system of taxation. That the people of the state are thoroughly in favor of improving the highways has been shown beyond doubt, that they appreciate this form of public improvement which is reaching to all parts of the state — to many sections that heretofore have not shared in State expenditures — is equally patent, but that they realize the importance of systematically maintaining the improved roads is not so evident. As will be seen in detail later in this report, the past year has witnessed the greatest activity along this line since the State undertook the work, many more miles having been built than during any previous year and much more having been contracted for. It is a noteworthy fact that, of the hundreds of miles advertised for letting, every piece of work has found a bidder and the contract has been awarded — a condition hitherto not existing.

In addition to the duties emanating from his relations to canals and highways, the State Engineer and Surveyor is called upon to make maps for use of the Attorney-General in the defense of suits before the Court of Claims; he is entrusted with the sale of lands under water; he is required to examine the plans for town and highway bridges, when submitted to him, and to examine and pass upon bridge plans presented by electric or steam railways, for use in crossing the canals and improved highways; he is often directed by the Legislature to survey and monument boundary lines between counties of the state or between New York and adjacent states or Canada; he is charged with directing the Geological Survey of the state in coöperation with the United States government, including the topographic survey and the gaging of flow of streams; and he is often requested to furnish estimates and reports on proposed legislation, and to perform other allied duties for the Legislature.

Additional duties devolve upon the State Engineer and Surveyor by reason of his membership of various boards and commissions, from which many subjects are referred to him for examination and report.

These boards and their duties are as follows:

The Canal Board.— Controlling the construction and maintenance of canals.

The Board of Commissioners of the Land Office.— Controlling the sale and purchase of State lands, and the granting of lands under water.

The Board of State Canvassers.— Canvassing the returns of elections.

The Board of Equalization of Assessment.— Equalizing the assessment of State taxes among the several counties.

CANAL MAINTENANCE.

During the past year the maintenance of the present canal system has been continued under the provisions of the general and special acts of the Legislature, the design and construction of the various works specified by these acts having been carried on under the direction of the State Engineer.

As in the past, the specifications have been modified wherever necessary in order to keep abreast of the times and in accord with the latest and most approved methods employed by engineers on the design and construction of similar works. The preparation of these standard specifications has received continued attention.

One of the recognized features of modern and improved construction, is the constantly increasing use of Portland cement concrete as a substitute for the more expensive cut-stone masonry, which was formerly used. Concrete is now generally specified for masonry structures and the requirements and the tests of Portland cement have been advanced and modified to accord with the great improvement made in recent years by American manufacturers, with the result that none but the best qualities of cement are used on State work. The best laboratories in this and other states have been visited, and their methods considered and adopted where it was thought desirable, so that the State now possesses one of the best laboratories in the country.

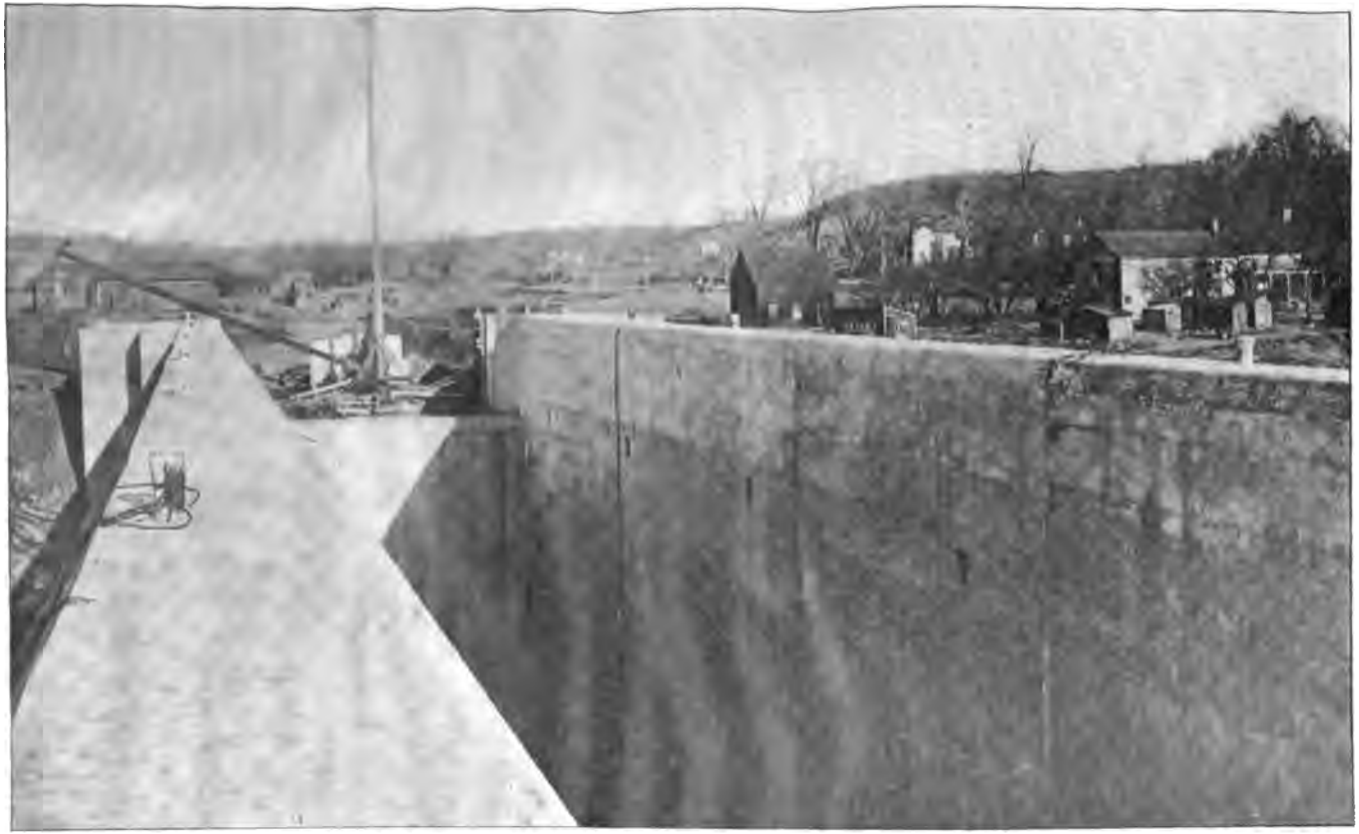
BARGE CANAL.

GENERAL DESCRIPTION.

The widespread interest throughout the country in the improvement of inland navigation emphasizes the wisdom of the people of New York in their determination to enlarge the State canals, and thus to enable the State to continue to reap the prosperity which the first canals so signally ushered in more than eighty years ago. The eagerness in demanding navigable water routes at the present time recalls the days of completing the original Erie canal, when a mania for canal-building swept over the land. Recently efforts have been made even in certain localities of this state to reopen, on an enlarged scale, some of the abandoned lateral canals. But the day of canals that do not join large industrial centers, or tap some extensive natural source of supply, is probably past, never to return. However, indications seem to point to a long usefulness for properly proportioned waterways, located in the right places — to control traffic rates and to supplement the transportation facilities of the railways.

In the first days of agitation for improved navigation, in the early colonial period, the natural advantages of topography in New York state were clearly recognized, and these conditions — a mighty river, navigable for one hundred and sixty miles from its mouth, far above the coast range of mountains, which is cut by no other Atlantic seaboard river in the country; a safe and commodious harbor at its outlet; from the head of natural navigation extending westerly across the state a chain of rivers and creeks with comparatively low summit elevations (one of these rivers having been forced by glacial obstructions in the natural outlet of a great system of inland lakes to cut its way through a rocky barrier of hills that form the northern extremity of a second range of mountains, and thus to become for a time the outlet of these great lakes), and this chain of westerly streams reaching to one of these lakes and nearly to another; these lakes penetrating to the very heart of the continent; from the head of navigation another series of valleys, with low divide, stretching in almost a straight north and south line to the metropolis of Canada — these conditions have ever been potent factors in bringing success to projects for canals and for subsequent enlargements along the routes in this state.

The people of New York are deeply interested in the progress and the early completion of the Barge canal — an enterprise that far exceeds the Panama canal in the number of structures required, the mileage and the amount and intricacy of the engineering studies involved. The Barge canal project necessitates the building of 55 locks of standard size (328 feet, between gates, by 45 feet, width of chamber) and six small locks, 25 fixed dams and 15 movable dams, 18 guard-gates, one steel arch viaduct of 230 feet span, three storage reservoirs, 220 bridges and numerous r structures. So important an undertaking requires the



Barge Canal, Contract No. 2.
View of lock No. 3, near Waterford, showing completed side and head walls.

greatest amount of care and involves most extended investigations of all existing and prospective conditions. Much labor was expended in making investigations and preparing plans before visible results in the form of construction could be shown. The greater part of this preliminary work is now completed, and it is probable that before the close of 1908 plans for all important contracts on the canal will be finished. Within the past year a larger amount of construction work has been done than during any previous year and contracts to the amount of about seven millions have been awarded.

The enterprise of enlarging the State canals is generally known as the "1,000-ton barge canal project," but this term is a misnomer under present conditions. By legislative revision, the locks are 45 feet wide, instead of 28, as originally contemplated. The result is that boats may be used, even in the restricted channel of 75 feet, that will carry nearly twice one thousand tons. Less than one-quarter of the whole 440 miles of the canal, including the Erie, Champlain and Oswego divisions, will have a 75-foot channel. If these portions should be slightly widened at some future time, so as to allow the passing of two boats that would occupy the full lock width, the capacity of one such boat would be about twenty-six hundred tons. Just what will be the economical size of boats under new conditions — whether one large boat or a tandem of two smaller boats, or whether it may not prove that the best results will be secured by a fleet of four one-thousand-ton barges that will require two lockages in passing each lock, or by a fleet of four boats, each about one hundred and fifty feet long by twenty-one feet wide, with a combined capacity of about three thousand tons, which can attain a comparatively high speed and can be passed at one lockage — this is a question yet to be determined.

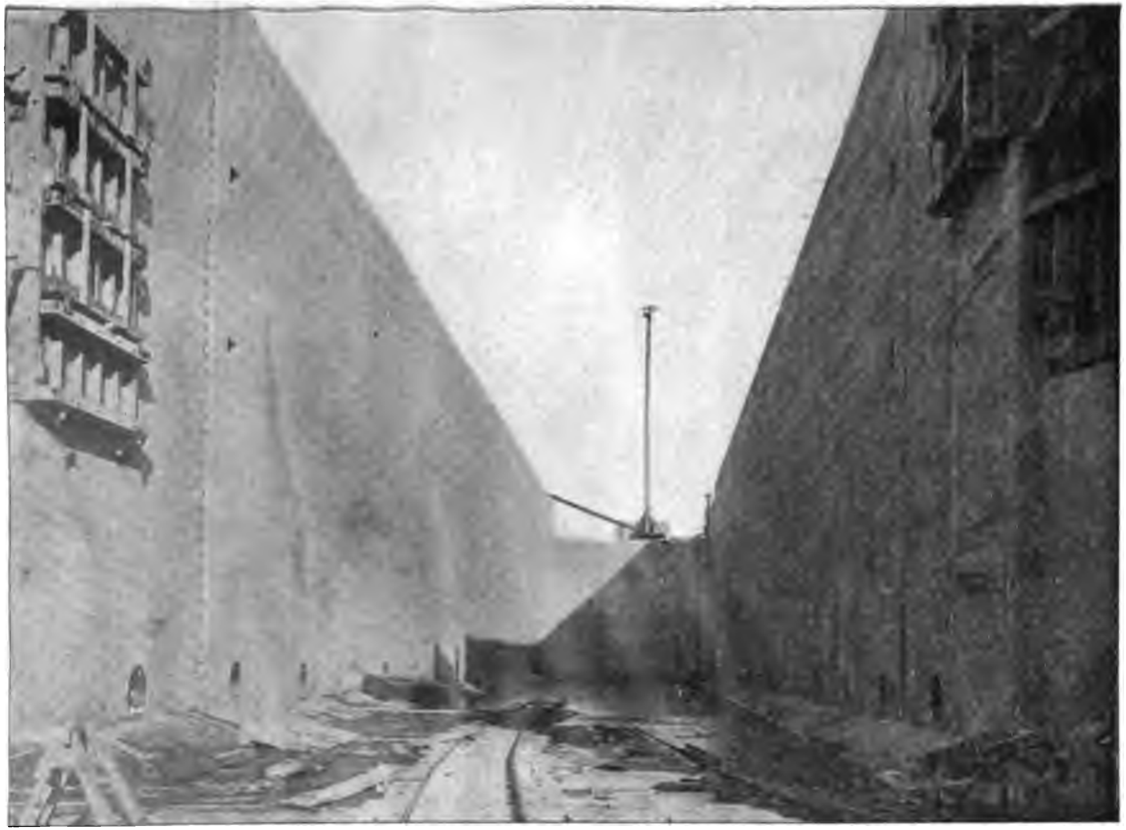
It is quite probable that the completion of the Champlain division of the Barge canal will soon be followed by work by the Canadian Government along the Richelieu river, and possibly along a 40-mile cross-cut from St. Johns to Montreal, on what is known as the Caughnawaga route. Such action would produce a 12-foot international waterway on almost an air line between the metropolis of the United States and that of the Dominion of Canada.

The completion of a canalized Lakes-to-Gulf route — a scheme which is now becoming a most popular agitation throughout the whole Middle West — would probably divert considerable portions of the traffic that would otherwise choose the Erie canal outlet, but that project is far from an accomplished fact as yet, and, if it is ever completed, the New York route has a great advantage in the matter of distances. Measured along the courses of the Illinois and Mississippi rivers, Chicago is fully 1,600 miles from the gulf, and then New Orleans is about 1,700 miles farther from Liverpool than is New York. The total distance from Chicago to Liverpool by this route would be about 6,300 miles — 2,000 miles farther than by New York. To state the condition briefly — after a 1,600-miles trip from the lakes to the gulf, a vessel would be 400 miles farther from Liverpool than at the beginning of its voyage.

In anticipation of competition along this and the Canadian routes, a movement is on foot to improve the terminal facilities of the Barge canal and to place them under State control, in order that the capacity of this great free public waterway may not be restricted by the present antiquated and inadequate facilities. Doubtless the consideration of this subject will come before the present Legislature. It is a matter worthy of most careful deliberation and treatment.

AID BY THE UNITED STATES GOVERNMENT.

One portion of the work, which was included in the original estimate, has not been planned for, inasmuch as it is hoped that the United States Government will undertake this part. This is the canalization of the Hudson between Congress street bridge at Troy and Waterford. Surveys have been made by the United States engineers, but Congress has not yet acted upon their report. It is anticipated that the next river and harbor bill will contain an appropriation for this work. The improvement of Black Rock harbor, for which the Government has made provision, is now under way and another contract is about to be let. It is expected that eventually Congress will make appropriation for all of the work between Tonawanda and Lake Erie. This portion was also included in the one hundred and one million-dollar estimate.



Barge Canal, Contract No. 2.

View of lock No. 3, near Waterford, looking up through the chamber of the lock and showing the completed portion at the upper end.

CHANGES OF LOCATION.

Between Fox Ridge and Macedon.

In the last annual report of this Department a change of location between Fox Ridge and Macedon was recommended. An opinion from the Attorney-General had been obtained to the effect that some action of the Legislature would be needed to authorize this alteration, inasmuch as the language of the Barge canal act was very explicit concerning the location at this point. After carefully considering the benefits to be derived by this change, I deemed it wise to endeavor to obtain permission to relocate the route. At the last session, legislation (chapter 710) was enacted toward this end. Surveys, including most of the borings, have been completed, and maps are being made in preparation for completing plans. The length of the new line will be nearly 43 miles, an increase of 8 miles, but there will be little or no increase in the time required for navigation, since the wider channel will permit greater speed. There will be a decrease in the cost of construction by the change; the general drainage of the Seneca river and of Clyde river and its branches will be benefited; there will be little interference with existing villages and towns (a feature so objectionable in the original location); the alteration also results in placing the canal in the bottom of the valleys, where the leakage will be minimized and all of the water of the region will be available, whereas the former line would require that all water should be brought from Lake Erie. This change takes the main channel much nearer to Cayuga lake. If the project of extending the Barge canal to that lake (a survey for which was described in the 1905 report of this Department) is ever carried into effect, it will be necessary to open a way simply between the confluence of Seneca and Clyde rivers and Cayuga lake and will result in the saving of about a million dollars for that enterprise.

Between Frankfort and Contract No. 4.

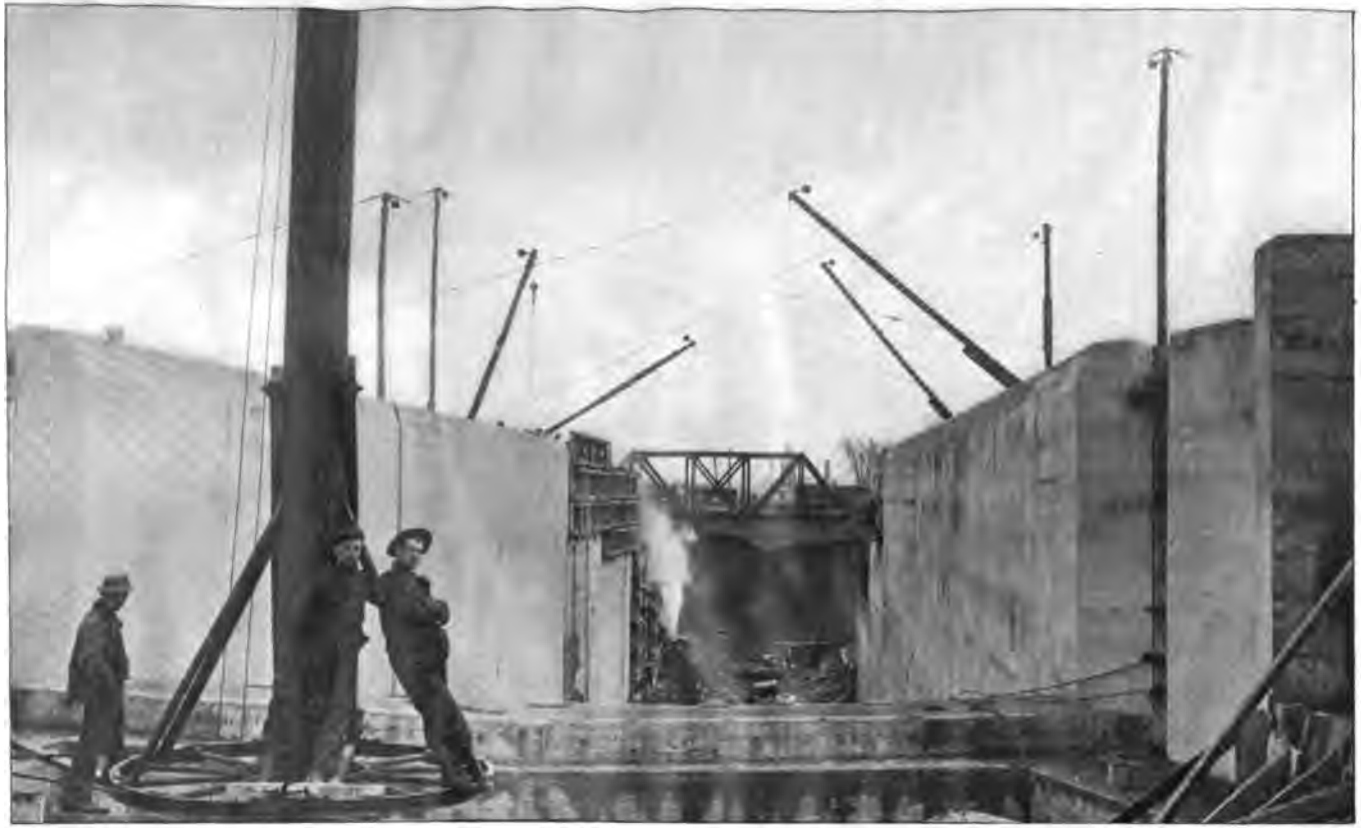
Plans and estimates on what is known as the north route through Rome had been well advanced a year ago, but a final decision had not been reached concerning the exact location in this vicinity. The citizens of Rome made such serious objections to the proposed alignment, which carried the canal through the city, that it was decided that a further and more careful study should be made. A more feasible and better line was surveyed, and it was determined to locate the channel farther to the south, thus avoiding the damage to valuable property adjacent to the north line — especially the making of objectionable bridge approaches in the city streets — and to eliminate interference with business interests, one large industrial plant having been entirely cut off from trolley and railroad communication by the northern route. The problems involved in locating a line in this vicinity are not easy of solution. Surveys have been made along three routes between Oriskany and the eastern end of contract No. 4, about four miles east of Sylvan Beach, but many details must still be studied before arriving at the correct decision.

The section just east of this place is also receiving attention. Several different routes have been surveyed with the view of obtaining a location which would not cause grave modifications of the regime of the river floods to the detriment of the maintenance of the canal, but which would afford satisfactory access to the canal by the citizens of Utica, and also further benefit the industrial interests of Utica.

BUREAUS FOR SPECIAL INVESTIGATIONS.

A bureau of electrical equipment has been added to the Barge canal office. This bureau is engaged in investigating the problems of generating electrical power at the various State dams and of transmitting that power to the locks, movable dams, guard-gates and other structures along the canal, for use in furnishing light and means of operating these structures. Studies are being made to ascertain the proper method of applying the power to the machinery, and plans are in course of preparation for the installation of this electrical equipment. A wise measure was enacted by the recent Legislature (chapter 494, Laws of 1907), which prohibits the State from disposing of any existing or prospective power at State structures to individuals or corporations until all the needs of the canal have been supplied.

Soon after the main office of the Barge canal was opened, several bureaus — general drafting, river, lock, computing, check-



Barge Canal, Contract No. 2.

View of lock No. 3, near Waterford, looking down through the chamber of the lock and showing the upper miter-sill in place.

ing,— were established so as to specialize each class of work under a competent head and an efficient force of assistants.

A bureau of bridges existed already in the Department and this was transferred to the Barge office and charged with the duty of caring for the structures built of steel. This bureau will be described more fully under its own heading.

As will be stated in connection with my remarks concerning the coöperative hydrographic survey, a bureau of hydrography has been established in the Barge canal office. The value of such a bureau will be set forth in these same remarks.

A bureau of water-supply has also been established, but with headquarters at Syracuse. This bureau is charged with collecting data and making studies for furnishing water to the Rome summit level — a locality that has required constant attention throughout the history of the existing canal, lest the supply should become inadequate.

CHANGES OF PLANS.

A considerable amount of time has been consumed during this year in revising plans. On contract No. 4, just east of Oneida lake, a timber revetment had been planned to serve as the bank protection. In construction it was found that the nature of the sandy soil was such that this revetment failed, the soil behind and beneath washing into the prism and rendering the timber of no use. Remodeled plans provide for increased excavation, widening the cut on top till the banks assume a natural slope (about one on four) and using no other form of protection.

The work of standardizing and unifying plans for locks, where differing designs had prevailed, has been performed. This has consisted largely in making uniform plans for building lock-gates and for attaching the gates to the locks and the motive power to the gates. This change will reduce the cost of repairs and renewals of parts. Where the work of construction has not progressed too far, this alteration has been made in existing contracts. There have been numerous other changes throughout many parts of the whole extent of the canal. Thirty-four alterations, or supplementary agreements, have been made during the year in 16 contracts under construction, which have involved 204 items of work. The magnitude of the work involved in making these alterations can be appreciated when it is stated that 135 new sheets, 24 x 36 inches, have been substituted for 160, which have been eliminated because of faulty design. The cost of making the changes in these plans and the investigations incidental thereto have amounted to between forty-five and fifty thousand dollars. A large proportion of the work of the office has been devoted to these subjects and they have demanded the most careful attention.

SPECIAL STUDIES.

For the long level between Rochester and Lockport special studies have been in progress to ascertain the navigable stage of water and the necessary height of embankments, also the number and proper locations for guard-gates and spillways.

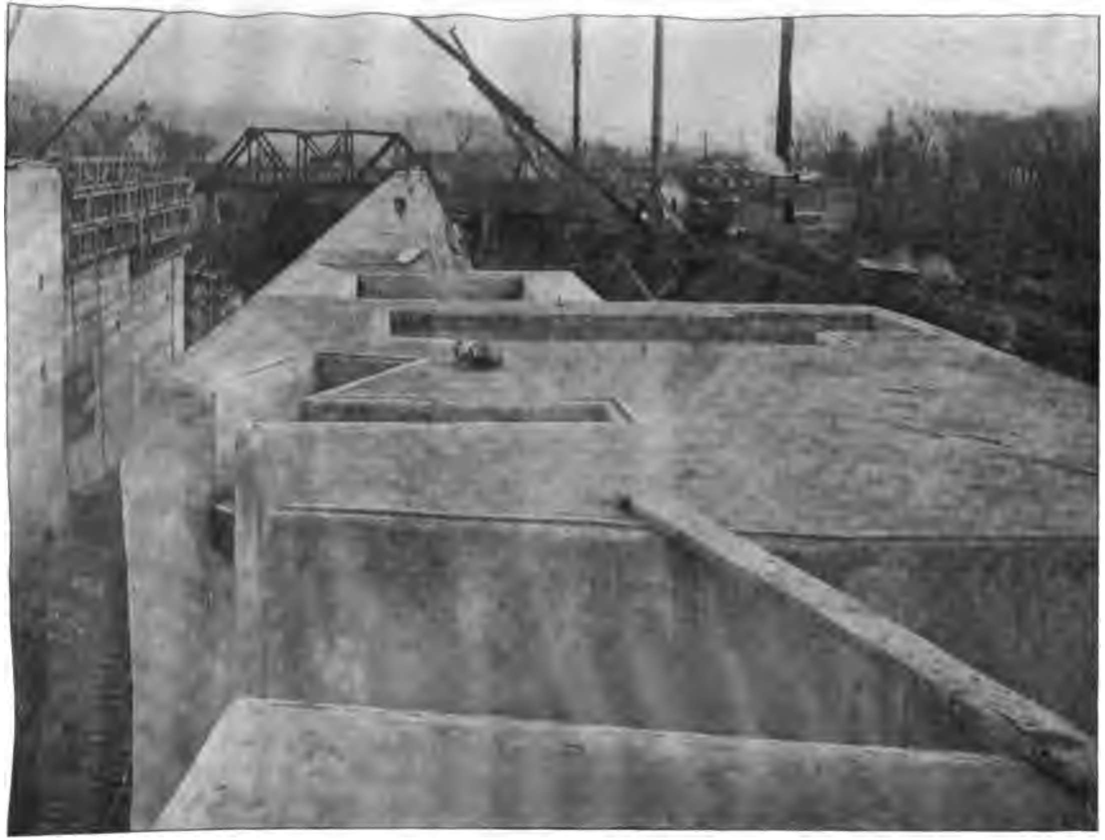
Investigations have been made to determine the effect on the Rochester pool of building a proposed dam in the Genesee river. The object sought is to make the dam of proper form and location with spillways of such length and height as to lessen rather than increase the liability to flood damages, to which this locality is subject.

Studies have been made to find the type of dam to be adopted at Phœnix in order not to damage the properties in Syracuse or other lands adjacent to Onondaga lake.

Investigations have been made along the Sacandaga river, so as to guard the State's rights to the needed supply of water for the summit level of the enlarged Champlain canal. Plans for a proposed dam and storage reservoir are being made by a private power company, and this Department is taking precautions to preserve the right of the State to control the water in the Hudson above the head of the Glens Falls feeder so that the existing supply may not be regulated in such a manner as to deprive the canal of the requisite amount during certain hours of the day.

In the process of making plans, many studies have been made to determine water-levels, slopes, flood discharges, size of prism, number, location and lift of locks, types of dams and like questions. Among the problems the subject of the canal and harbor at Syracuse has had careful attention.

Numerous other subjects have been considered and conclusions reached with the result that the work has been so systematized



Barge Canal, Contract No. 2.

View of lock No. 3, near Waterford, showing the openings in one of the side walls at the upper gate. The opening in the foreground is to receive the machinery for operating the gate; the second opening is for the anchorage of the gate; the third, for the machinery to operate the valves, and the fourth to contain a capstan.

that the preparation of future plans and estimates for contracts can be advanced much more speedily than heretofore.

PROGRESS OF WORK.

There are now under contract 127 miles of canal, at contract prices that aggregate $22,395,591. Additional plans are completed for 65 miles, at an estimated cost of $4,867,659. As previously stated, it is expected that plans for the remainder of all important contracts will be finished by the end of 1908.

The work of construction is now in progress on the Erie canal at the following places:

Waterford; Vischer's Ferry, Rotterdam, Cranesville and Amsterdam on the Mohawk river; Sylvan Beach on Oneida lake; between Mosquito Point and Fox Ridge on the Seneca river; Rochester, and between Lockport and Tonawanda.

On the Champlain canal work is being performed at these places: Fort Edward; Dunhams Basin; Fort Ann, Comstocks and Whitehall on Wood creek.

Along the Oswego canal the contractors are working at Fulton and Oswego.

RECOMMENDATION.

It is recommended that the Legislature coöperate with this Department in an endeavor to induce Congress to take the necessary action to extend the jurisdiction of the United States Government over the Hudson river from Troy to Waterford and to make appropriation for the work of canalizing that portion of the river.

HIGHWAY IMPROVEMENT.

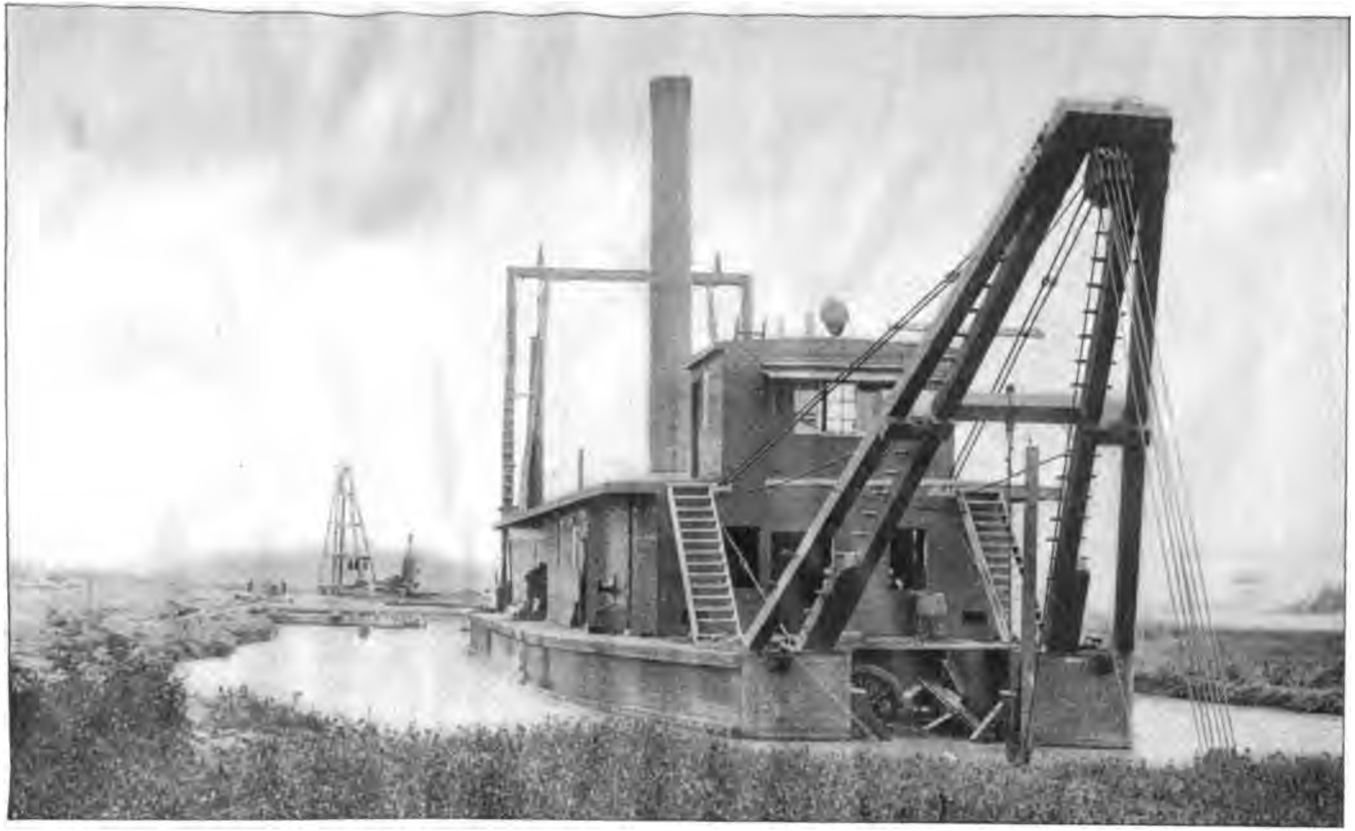
HIGBIE–ARMSTRONG LAW.

Never before in the history of the highway improvement has the demand been greater or the interest keener. This work, which began in 1898, after the passage of the Higbie-Armstrong Act by the Legislature, on a very modest scale, has increased in amount in each of the following years, until at the present time it has assumed large proportions. A thousand miles of highway have been improved, in forty-two counties of the state. A thousand miles are now or will, before February 1, 1908, be under contract. In addition plans for over eight hundred miles have been prepared by the State Engineer and approved by the counties, which have appropriated their share of the money for construction.

The improvement of market roads was confined to a few counties at the start. The total money available each year was about $100,000 for the first three years. Now State roads have been constructed in 42 counties out of the 57 counties outside of Greater New York. Contracts have been let in eight other counties, and improved highways will be constructed in these counties during the coming year. There are only seven counties in the state, outside of the counties of Greater New York, in which improved roads have not been constructed or are under contract. Of these seven counties only two have not petitioned for improved highways.

A new impetus has been given to roads improved by State aid by the passage of the Cobb Act by the Legislature in 1907. By the provisions of this act the State bears a greater proportion of the expense in the poorer counties, and this encourages them to take up the work of improvement. This act, which is an amendment to the Higbie-Armstrong Act, bases the amount which the State, county and towns shall pay, upon the assessed valuation per mile of highway, providing, however, that the county shall not pay to exceed 35 per cent of the cost of construction in any county. Under the provisions of this act the State pays as much as 91 per cent of the cost of construction in some counties, while some of the poorer towns pay as low as 1 per cent of the cost of construction.

The State now has a systematic and intelligent plan which will enable the people paying for the improvement of the public highways to obtain the best possible results for the amount of money expended. The State Engineer has prepared a map of each county, showing upon the same the main highways which he deems of sufficient importance to be improved, and preserving a thorough system of highways between the popular centers, also making connections in each county with the roads to be improved in the adjoining counties. The State Engineer, after conferring with the various boards of supervisors in each county and securing their approval to the map, submitted the same to the Legislature. This map was approved by the Legislature.



Barge Canal, Contract No. 15.
View of the hydraulic dredge "Champlain" making prism excavation.

Hereafter no highway can be improved by State aid unless the same is designated for improvement on this map.

While through the provisions of the Higbie-Armstrong law and subsequent amendments, the way has been opened for the establishment of a comprehensive system of improved highways in all counties of the state, the law in itself is not in any sense mandatory, but leaves it to the option of the county whether or no it will improve the roads designated within that county.

Through the law, as now amended, the State offers to pay from 50 to 90 per cent of the cost of construction, as an inducement to every county to improve its more important highways.

It must be remembered that prior to the year 1898 the town had to pay the entire cost of any highway improvement within its limits.

Thus the State supplies, through the Higbie-Armstrong law, and subsequent amendments, the necessary machinery, but it has left optional with each county as to whether or not the machinery shall be placed in operation. If the county desires to accept the invitation to have any particular portion of road improved, the county, through its board of supervisors, requests the State Engineer to survey the road and to prepare plans, specifications and an estimate of the cost of the improvement. When the plans and specifications are prepared by the State Engineer, they are submitted to the board of supervisors, and, if satisfactory, they are approved by them and an appropriation is made for the county's share of the cost. When the State's share of the cost is made available by the Legislature, a contract for the improvement of the road is awarded to the lowest responsible bidder, after due advertisement for two weeks in a paper published in the county seat of the county wherein the road is located and in other State papers. The town or county may bid for the work and, if they are the lowest bidders, may take the contract, construct the road and have the State pay its share of the cost.

Under the Higbie-Armstrong law, up to October 1, 1907, 10,568 miles of road have been petitioned for by the boards of supervisors of fifty-five counties.

Four thousand eight hundred and seventy-one miles of road have been surveyed.

Plans for 3,034 miles of road have been prepared by the State Engineer.

The plans and specifications for 2,650 miles of road have been approved by the State Engineer and the counties' share of the estimated cost has been appropriated.

Two thousand forty-six miles of road have already been improved or are now under contract.

Over $22,000,000 have been appropriated by State, county and town since the work of improvement began.

The following table gives a brief summary of the progress since State aid law has been in effect:

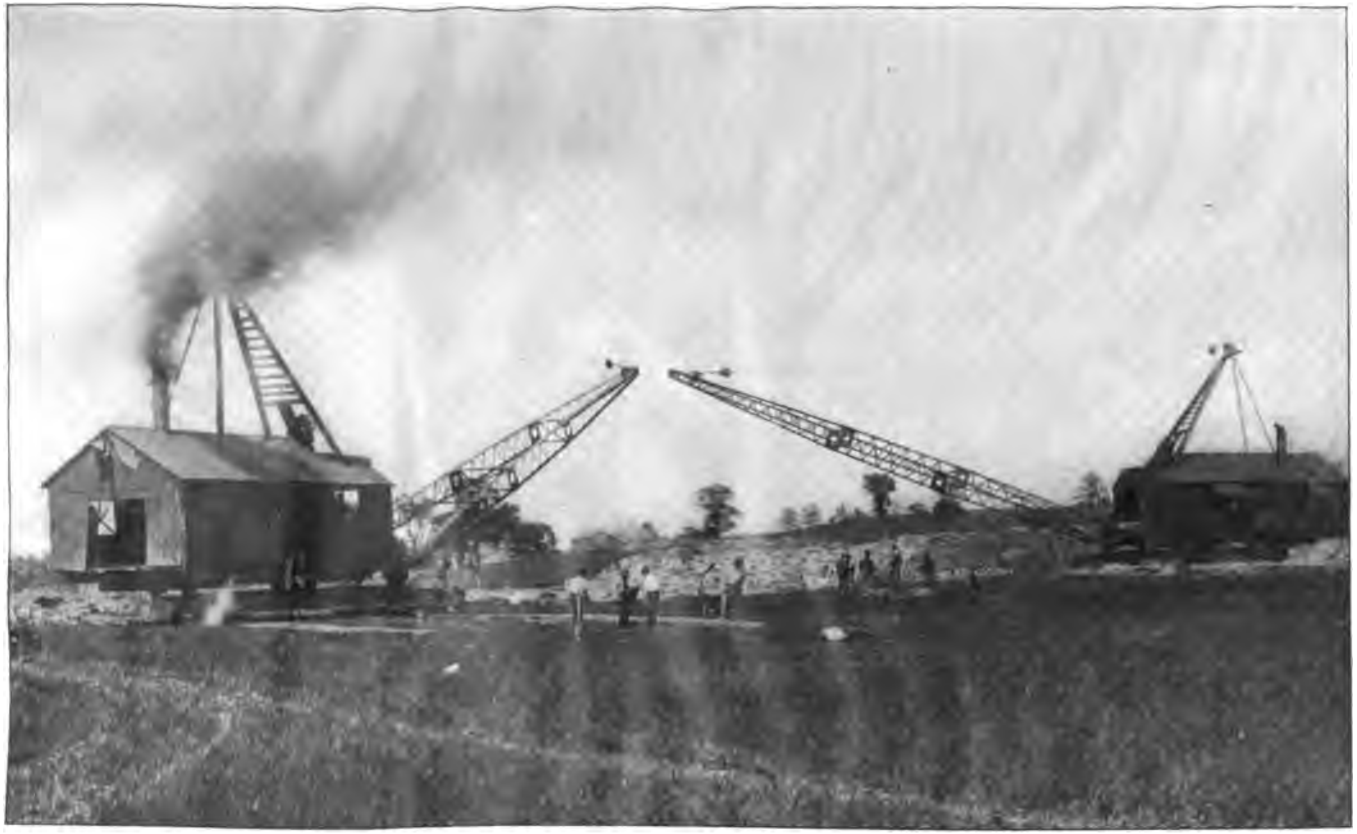
Comparison of Progress During Period in which the State Aid Law has been in operation in New York State, October 1, 1907.

DURING YEAR.	Total State appropriations.	Total appropriations by counties.	Total mileage covered by first petitions to date.	Total mileage of roads adopted by counties.	Total mileage of completed improved roads.
1898........	$50,000	$63.872	502	21	0
1899........	50,000	42,876	157	9	5
1900........	150,000	431,227	155	130	35
1901........	420,000	1,055,874	495	247	20
1902........	795,000	1,748,115	1,106	418	126
1903........	600,000	2,198,623	1,728	427	112
1904........	1,108,265	2,032,855	1,323	422	158
1905........	50,000	480,000	127	118	100
1906........	5,000,000	2,101,132	3,475	458	84
1907........	5,000,000	1,952,380	1,500	700	237
Total	$13,223,265	$12,106,954	10,568	2,950	877

The total State appropriation should be reduced by $2,000,000 because of the total of $5,000,000 appropriated in 1906, $2,000,000 was reappropriated in 1907.

Organization.

On account of the great increase in the volume of work and the wide separation of the various contracts throughout the fifty-seven counties of the state, it has been necessary to enlarge and extend the organization of the State Engineer's Department in the highway bureau. The State Engineer has recently caused the three divisions to be subdivided into a number of new and additional residencies. Each of these residencies covers from four



BARGE CANAL, CONTRACT NO. 27.

View of revolving derrick excavators, with Page buckets, on opposite banks of the new channel and excavating the prism between.

to five counties, according to the amount of work in that locality. A resident engineer is in charge of each of these residencies. An assistant engineer is appointed by the State Engineer to take charge of all the work in each county. This assistant engineer is assigned to the resident engineer and makes all his reports to him. The resident engineer in turn makes all reports to the division engineer, who has general supervision over all of the residencies in his division, and who, in turn, reports directly to the Deputy State Engineer and State Engineer. The advantages of this system are two-fold. It gives to the assistant engineer the opportunity to prepare the plans and specifications of all the roads to be constructed in the county under his supervision. It enables him to make a complete and extended study of the immediate locality as to the soil, climatic and local conditions, to thoroughly inspect and investigate the questions of drainage, subsoil conditions, etc., which may be peculiar to that particular county. He also becomes acquainted not only with the locality itself but also with the old inhabitants and highway commissioners, and he is thus able to obtain valuable information as to the portions of the highways which need special care as to drainage and subsoil preparation or extra foundation and the better to prepare the plans upon which all improved roads are to be built.

Another advantage to be derived from this system is that the same engineer can be held responsible for the results in any one county and can study and observe the results of the different forms of construction used. It also places within easy reach of the county authorities an experienced engineer, who can be consulted at any time and who is thoroughly familiar with all the practices of the Department, and who has also the advice and instruction of his superiors who have a wide and extended experience in road construction, and who is also perfectly familiar with the local conditions.

It will be seen that this arrangement will bring the assistant engineer in closer touch with local conditions and he will be held responsible for all work executed in his county.

Maintenance.

The maintenance of the highways constructed under State aid has been placed in the hands of the State Engineer. Heretofore the appropriations have been very small and have become available too late in the season to enable the Department to obtain satisfactory results. In view of the great increase in construction work, it is to be hoped that the Legislature will be able to make sufficient appropriations, becoming available early in the season, to permit all of the repairs and maintenance which are always imperative in the early spring, and to allow a sufficient working season to insure the completion of repair work before the proper season for such work on macadam roads has passed.

The specifications for all road work have been thoroughly revised and all contracts let this year have been let under these revised specifications. Many features have been changed under these new specifications, the most notable of which is the change from the lump sum form of bidding to the common system of unit prices, by which system the contractor is paid at the price bid on each class of work and for only such as he may perform.

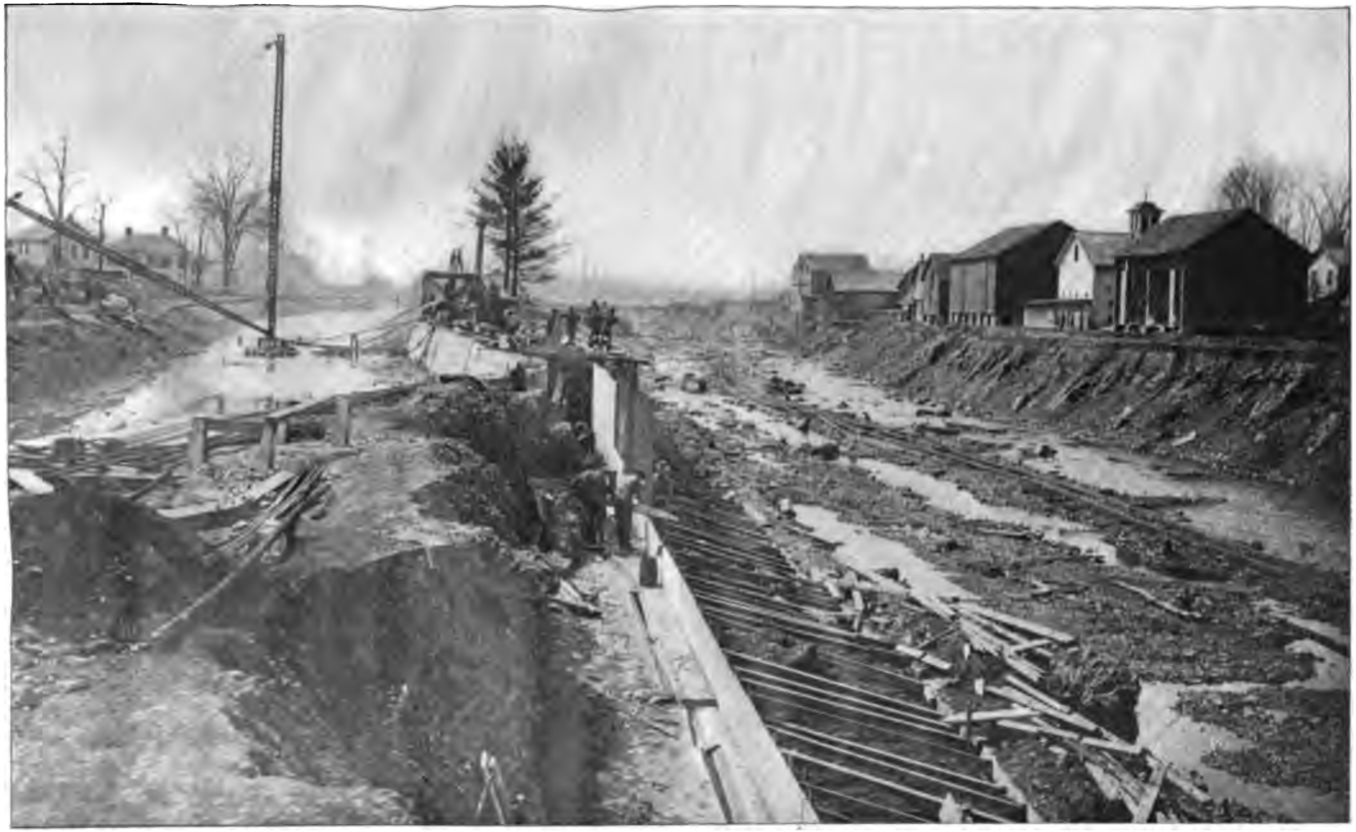
Other changes which have been made are the classification of earth, the sizing of stone and other minor features.

The use of the so-called three course roadway has been abandoned, having been found impracticable and having given far inferior results to the two-course road, which is the only type built under the new specifications.

I deem it my duty to call your attention to the injurious effect of rapidly-driven power vehicles upon the public highways of the state, especially those of macadam surface. The question cannot longer be ignored.

Ten years ago the Higbie-Armstrong bill became a law, as the first notable effort of the State to break away from the antiquated methods in vogue during the previous century and give to its citizens well-built and permanent highways in return for the money expended on their construction. This law was not placed upon the statute books without a twenty years' struggle of the few advocates of improved highways led by the League of American Wheelmen, then a strongly organized body of users of the roads.

The natural reluctance of the people to try expensive experiments and to make costly innovations, although the success of macadam roads had been proved in adjoining states, made necessary a long campaign of education before the law could be passed. The leading argument was that the farmers would be better pro-



Barge Canal, Contract No. 3.

View at Fort Miller, looking toward the site of lock No. 6 and showing the existing Champlain canal and the newly-excavated channel for the Barge canal.

vided for in marketing their crops. To this end they were permitted by the law to petition for a section of highway to be built in front of their holdings and were assessed according to their benefits, or practically according to their frontage, in partial payment therefor. At that period the use of the highways by automobiles to any considerable extent was neither forseen nor considered.

Within the past six years the State has built a thousand miles of macadam highways and is planning to build thousands more. Millions of dollars have already been expended for the purpose and millions more will be required. The question of maintenance of these highways is but in its infancy. Neither macadam nor any other kind of highway will last forever without constant repair and maintenance, and the rapid deterioration of their surface from any cause means the expenditure of more money to maintain them.

It is only within the past two or three years that the remarkable increase in the number of automobiles as well as in their weight and speed has made noticeable their effect upon the public highways. This damage appears to be caused in two ways. First, by the so-called suction of the broad rubber tire of a swiftly moving wheel upon the finely comminuted material of the wearing surface and binder, causing it to be displaced and thrown out to the rear, thus exposing the jagged corners of the top course of macadam, which are in their turn reduced to fragments and removed from place by the same agency. Second, by the direct picking action of numerous devices now used to roughen the surface of the tire and thus obtain a stronger hold upon the smooth surface of the finished road, by the use of chains and other appliances, termed in general non-skidding devices and intended to prevent side-slip of the wheels, especially in wet weather, or at high speed, or at turns in the road.

It is to be observed that speed is an essential element in causing the injury in both the cases named. The higher the speed of the machine, the greater is the injury inflicted. The law now permits no greater speed than twenty miles per hour upon the open highways of the state, yet it is a matter of common knowledge that this law is " more honored in the breach than the observance."

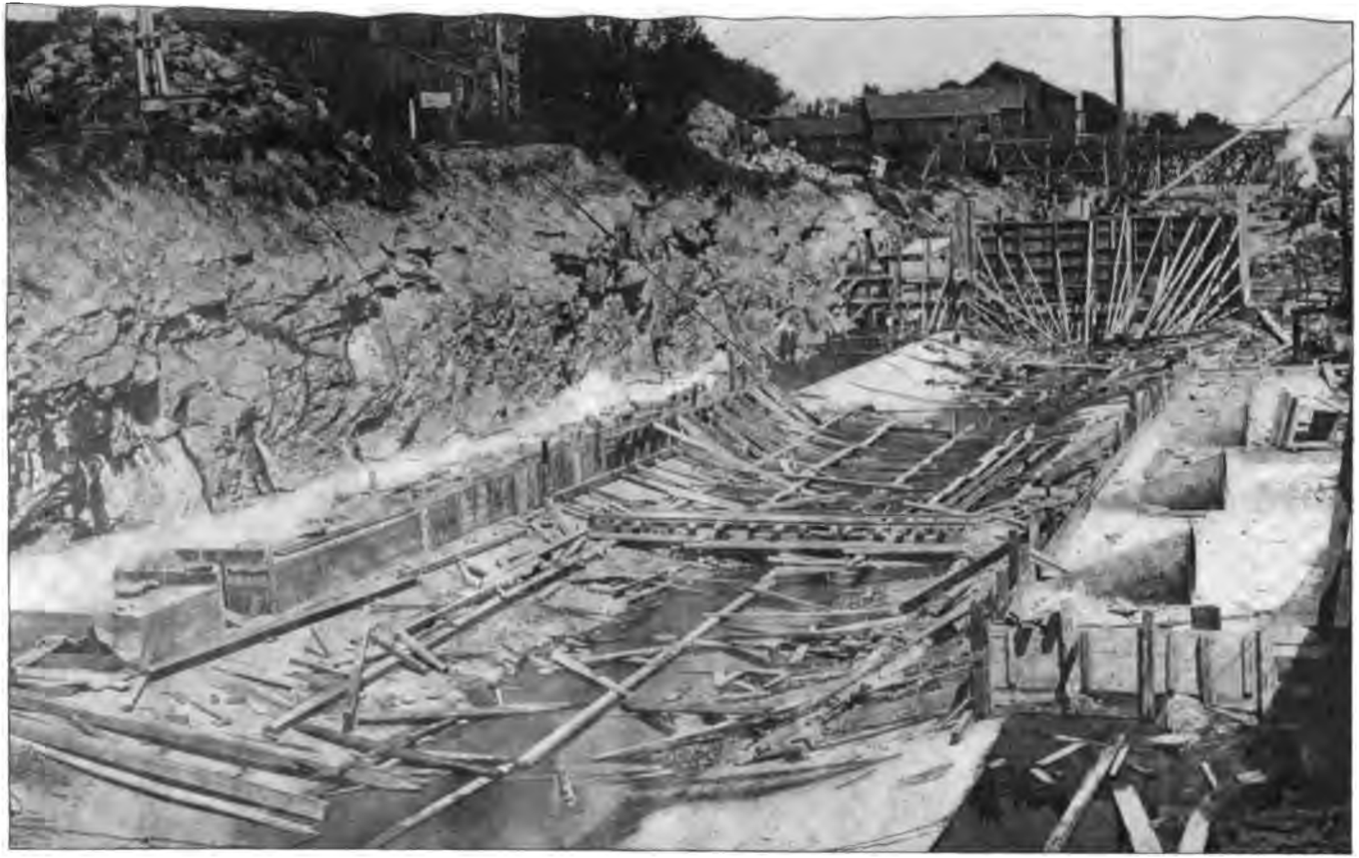
The engineer in charge of the Middle division, in his annual report, has called the attention to this condition, in substance, as follows:

"In conclusion, a comment on the destructiveness of the motor car to a macadam surface seems warranted. After a heavy motor car, with rubber tires, has passed over a macadam road at high speed, the wheel tracks may be followed readily by the eye, as the tires have sucked out the fine material from the surface for a width of four to six inches, leaving the sharp edges of the larger fragments exposed to the next iron-tired vehicle, which breaks off the sharp edges and smooths up the surface by crowding the chips broken off into the voids. The next motor car throws out the fine particles, again leaving the roughened surface, which is again ground off by the iron tires, and thus the rapid deterioration progresses."

Nor does New York stand alone in facing this emergent difficulty in the maintenance of highways. Massachusetts, a leading state in highway improvement, through the report of its State Highway Commissioners, comments upon "the extraordinarily destructive effect upon stone roads of the large number of swiftly moving automobiles." The main roads thus were affected. The binder was swept from the road, the No. 2 stone — ½ to 1½ inch — disturbed and left standing upon the surface or in windrows along the roadside. The commissioners deem a material charge in the methods of maintaining stone roads necessary. Methods satisfactory in the past, they say, fail under present usage. The automobile has come to stay and must be reckoned with. They say that this excessive wear is not confined to Massachusetts. The same trouble is experienced all over the United States. The roads of England, France and other countries are showing signs of destruction by the same agency.

The highway authorities of Connecticut, Rhode Island, New Jersey and other states echo the complaint.

The New Jersey Commissioner of Public Roads says: "The automobile is now a recognized means of conveyance, and as such is entitled to the use of the highways, but there are certain appliances used upon them which are very detrimental to our roads. They are the armored tire, the chain tire and the blower.



Barge Canal, Contract No. 3.
View of lock No. 6, at Fort Miller, looking toward the head of the lock and showing progress in constructing the floor and side walls.

" The damage done to the surface of our macadam and gravel roads by these appliances is so great that the question of a remedy is creating considerable agitation all over the different counties of the state.

" The temptation to get all the speed possible out of any means of locomotion is almost irresistable; therefore no one should be allowed to run a machine upon our public highways without first obtaining a license, granted after a proper examination, as the majority of accidents are caused by incompetent chauffeurs. If the high speed machines are to be allowed upon our highways, they should be taxed in proportion to the maximum speed of which they are capable. In other words, they should pay for the damage they do, and all money paid into the State Treasury for such licenses should be applied to the maintenance and repair of our roads.

" The dust raised by an automobile, when running at a rate of less than twenty miles an hour, is not any worse than that raised by many wagons, but when this limit is exceeded, the automobile becomes the dust nuisance. Many cures for the dust annoyance have been suggested, as the sprinkling of our roads with crude oil and different solutions of absorbent salts. These will prevent the dust, but are too expensive to be generally used. Our remedy, therefore, would be a strict enforcement of the speed limit, the abolition of the armored tires, chain tires and blowers, and a sprinkling of all our improved roads early in the morning and late in the evening. This would preserve the roads and would reduce the cost of repairs very materially, at the same time giving us a better, smoother and more dustless surface than we now enjoy.

" There is no better or cheaper way of preserving our roads than by sprinkling. Water for this purpose can be obtained from neighboring streams and in those sections where there are none, from wells driven beside the road."

Bulletin No. 29, Office of Public Roads, Washington, D. C., issued June 29, 1907, says (page 29):

"At the present time the worst foe of the macadam road is, perhaps, its most ardent advocate, the motor vehicle. The steel wheels of the ordinary vehicle grind off sufficient powder from the stones to serve as a binder, replacing the binding material blown away by winds or washed off by rains. It is usually possible when the binder becomes deficient and the stones in the upper course begin to appear and the surface grows rough, to spread a little coarse sand in the center of the macadam road. The sand is soon spread by traffic over the greater portion of the width of macadam. It relieves the roughness and keeps the stones from raveling. This practice has been followed in many sections for years. But the swiftly moving motor car of the present day has introduced a new problem into road maintenance. The large rubber tires on wheels of small diameter appear to exert a suction on the binder of the road. The vacuum caused by the vehicle moving rapidly over the road lifts the dust into the air in clouds, and it is blown away into the fields."

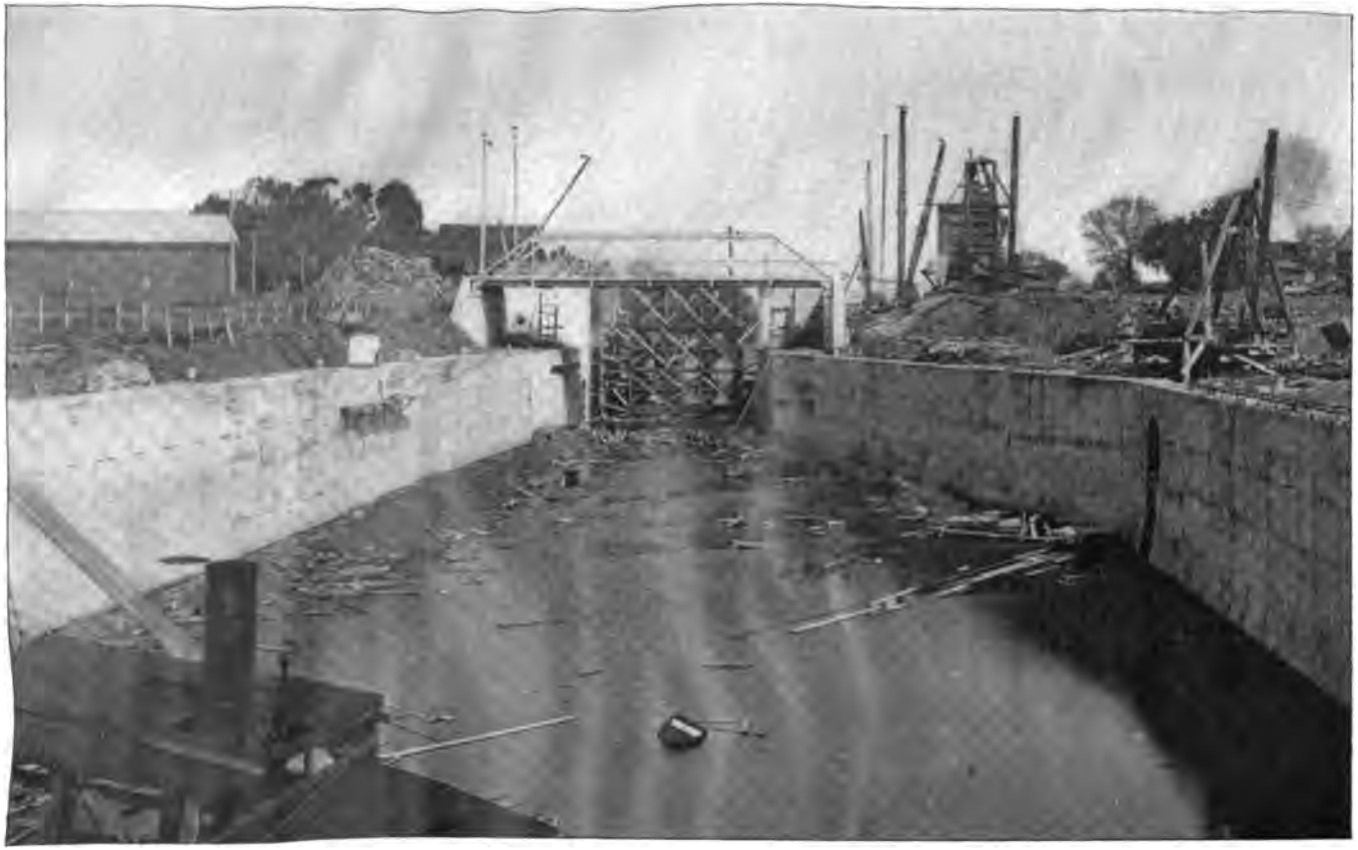
The New York City Board of Parks, whose jurisdiction covers the parkways of Greater New York, has given careful attention to the matter and by an ordinance passed in December last has barred chained wheels from the system under its control.

The Massachusetts Metropolitan Park Commissioners, who have charge of the beautiful system of parkways in the suburban district of Boston, have made the same complaint and taken measures of protection.

It will be observed that the injury complained of is not confined to this state, but is coexistent with improved road systems, whether of macadam or other surfacing. It will also be observed that speed is an essential element to produce the injury referred to, slow moving automobiles causing less injury in this regard.

Numerous experiments have been made both in this state and elsewhere by the use of tar, crude oils and other liquids and their effect has been carefully observed. It is conceded that the dust nuisance has been obviated to a considerable extent wherever they have been properly used. Sufficient time, however, has not elapsed since their use to form definite opinions as to their ultimate value. It may be said that they are open to the objection of continued expense of repeated applications and that at best they are only palliative and not curative.

In addition to the continuance of such experiments and observation of results the subject is recommended to the Legislature for such measures of other and further relief as it may deem best, to



Barge Canal, Contract No. 3.
View of lower approach-walls to lock No. 6, at Fort Miller. The lock and highway bridge are seen in process of construction.

the end that our system of improved highways may be preserved to the uses for which they were intended.

MONEY SYSTEM OR FULLER — PLANK ACT.

In the year 1898, section 53 of the Highway Law was placed upon the statute books. This act provides that any town in the state may, by a vote of the electors, decide to adopt the money system and annually receive State aid of fifty per centum of the amount so levied in each town for highway purposes. In 1907 this law was changed and now provides that a town whose assessed valuation averages only $5,000 per mile shall receive dollar for dollar State aid; a town whose assessed valuation averages not over $7,000 per mile shall receive ninety cents on a dollar State aid; a town whose assessed valuation averages less than $9,000 per mile shall receive eighty cents on a dollar State aid; a town whose assessed valuation averages less than $11,000 per mile shall receive seventy cents on a dollar State aid; a town whose assessed valuation averages less than $13,000 per mile shall receive sixty cents on a dollar State aid, and a town whose assessed valuation averages $13,000 per mile or more shall receive State aid amounting to fifty cents on each dollar raised for highway purposes. The moneys thus raised by the town, together with the amount of State aid to which the town is entitled, are placed in the hands of the supervisor who is the custodian thereof and is required by the provisions of this act to file a proper bond or undertaking with the town clerk.

The Fuller-Plank act as amended in 1907 now provides that no payments shall be made until the town board and commissioner of highways have determined how and where the moneys shall be expended and the commissioner or commissioners of highways have entered into a written agreement with the town board to expend such moneys as thus determined. It also provides that the town board and commissioner or commissioners of highways shall together constitute a board to determine the amount of money to be raised annually by tax for the repair and maintenance of highways and the manner in which the moneys thus raised and thus received from the State shall be expended.

Following the enactment of the Fuller-Plank Law in 1898, 43 towns having 3,696 miles of highways adopted this plan of working their roads. In the year 1900, 75 towns having 6,497 miles of highway, worked their roads under the money system. To-day the popularity and success of the money system of working roads is demonstrated by the fact that 567 towns, having 48,190 miles of roads to care for, are working under the money system, and by the further fact that during the past year 99 towns have voted to do the work under the money system and in the entire state only two towns already under the system have voted to abandon the money system. A great many other towns have voted to adopt the money system, but the change does not take effect until January 1, 1909, owing to the fact that the vote was taken after July 1, 1907. It is expected that practically all of the towns of the State will have voluntarily adopted this system by January 1, 1909.

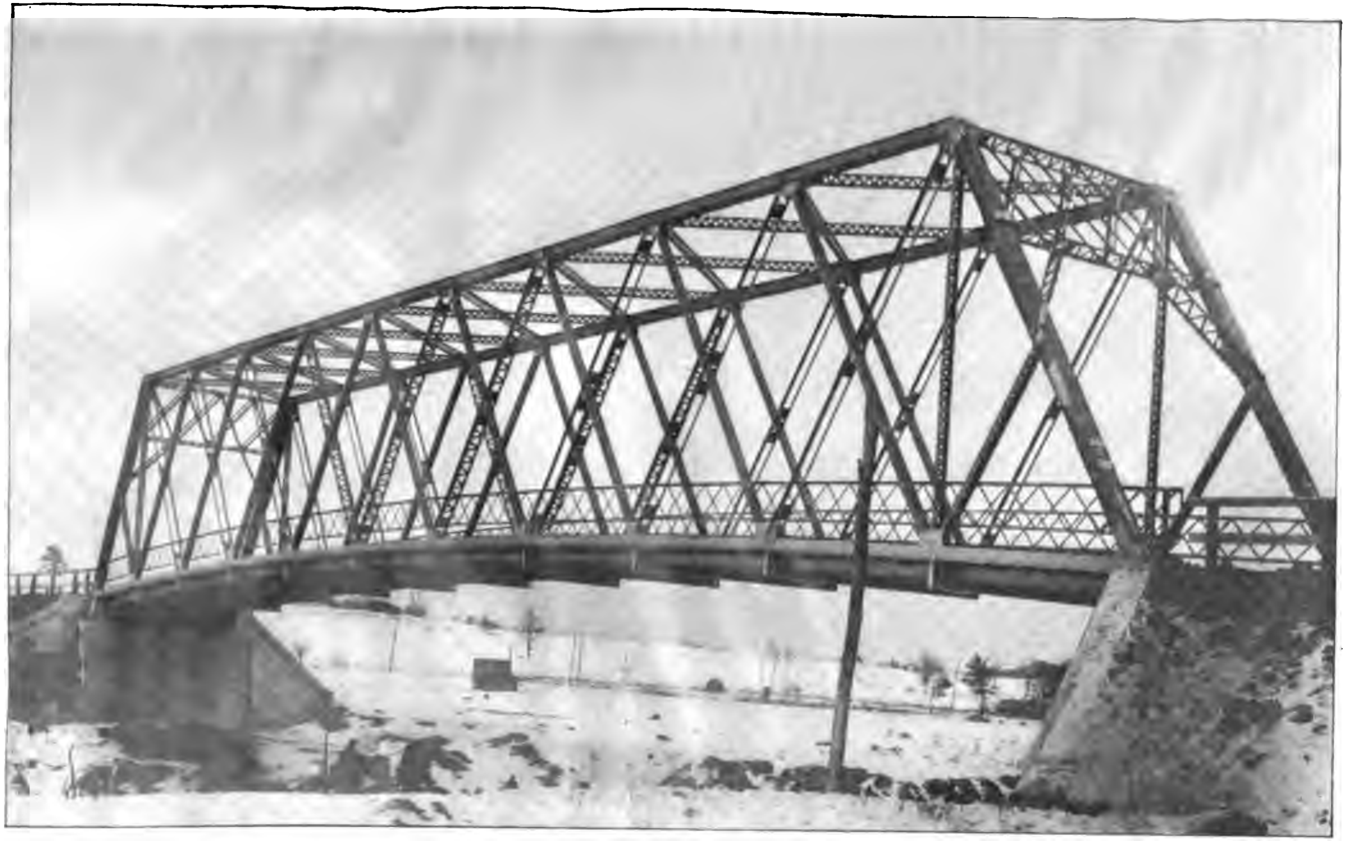
The following table will show the results from year to year since this act was placed upon the statute books:

YEAR.	No. of counties benefited.	No. of towns receiving State aid.	No. of miles of highways under the money system.	Amount of State aid paid to the towns.	Amount raised for highway purposes by towns.
1899..........	8	43	3,696	$34,517 00	$138,070 00
1900..........	14	75	6,497	54,057 00	222,767 00
1901..........	21	100	7,521	67,655 00	269,994 00
1902..........	24	139	11,681	102,509 00	419,491 00
1903..........	44	258	24,372	272,249 00	672,734 00
1904..........	51	370	30,952	393,493 00	917,873 00
1905..........	54	416	36,100	483,355 27	1,062,803 22
1906..........	56	468	38,857	594,591 25	1,206,462 38
1907..........	57	567	48,190	721,849 32	1,881,041 52
Total..............................				$2,724,275 84	$6,791,236 12

In addition to the amounts given in the above table there was expended in those towns in 1907, $886,567.34 for bridge and miscellaneous purposes; for extraordinary repairs, $57,627.11; and for compensation of highway commissioners, $263,236.04, making a total expenditure for highway purposes in the money system towns of $3,810,321.33.

From time to time since 1904 bulletins have been issued containing such directions or information as seemed necessary for the direction and guidance of town officers.

Section 27 of the Highway Law now provides that the supervisor and highway commissioner or commissioners of every town which has adopted the money system shall annually make a verified



BARGE CANAL, CONTRACT NO. 3.
View showing completed East street bridge at Fort Miller.

report to the State Engineer and Surveyor, on a blank form prescribed by him, showing the total amount of moneys received during the preceding year for the construction or maintenance of highways or bridges, and for other highway purposes, indicating the source thereof, with all expenditures for the improvement, repair and maintenance of highways, for the repair and maintenance of bridges and for the construction of new bridges; for damages and charges in laying out or altering highways; for the removal of obstructions caused by snow; for the purchase of machinery, tools and implements; for highway commissioner's salary or per diem allowance, or for any other highway purpose, and also showing the machinery, tools and implements owned by the town and the districts thereof and the value of the same.

Section 28 of the Highway Law is to the effect that the State Engineer shall prescribe the form of blanks to be used by the town officers in keeping account of the moneys received and paid out for bridge or miscellaneous purposes in connection with highway work. In accordance with these laws uniform blanks have been prepared for practically everything connected with highway work throughout the state. As a result, reports from all towns under the money system are now uniform; their bookkeeping is uniform and all orders, vouchers, determinations and resolutions are also uniform throughout the state, and those forms comply strictly with the Highway Law and are of great assistance to town officers and the State officers who have charge of highway matters. It is thought that this uniform system will compel an honest and economical expenditure of the taxpayers' money as well as State aid money.

An effort is being made to get State aid to the various towns early in the year. It is of great importance that towns should receive State aid to pay for highway work at a time when the work is being done and it is unanimously conceded that the only proper time to work dirt roads is in the spring of the year. The town boards and highway commissioners are required to lay out, during the winter months, their entire plan or scheme of working the roads of the town, divide the town into a suitable number of districts, engage their help and place a competent man in charge of each district to the end that the work may be done when the soil is in a proper condition.

All towns under the money system have been urged to build each year some roads of a permanent nature, such as gravel or crushed stone. Nearly every town in the state has some roads which ought to be permanently improved in addition to the roads which are on the State map for improvement under the fifty million bond issue. In the main, these roads are short pieces and can be built much cheaper by the local town officers under the money system than in any other way.

During the winter months schools of instruction are held in as many of the money system towns as the force of supervisors of highways will permit.

RECOMMENDATIONS.

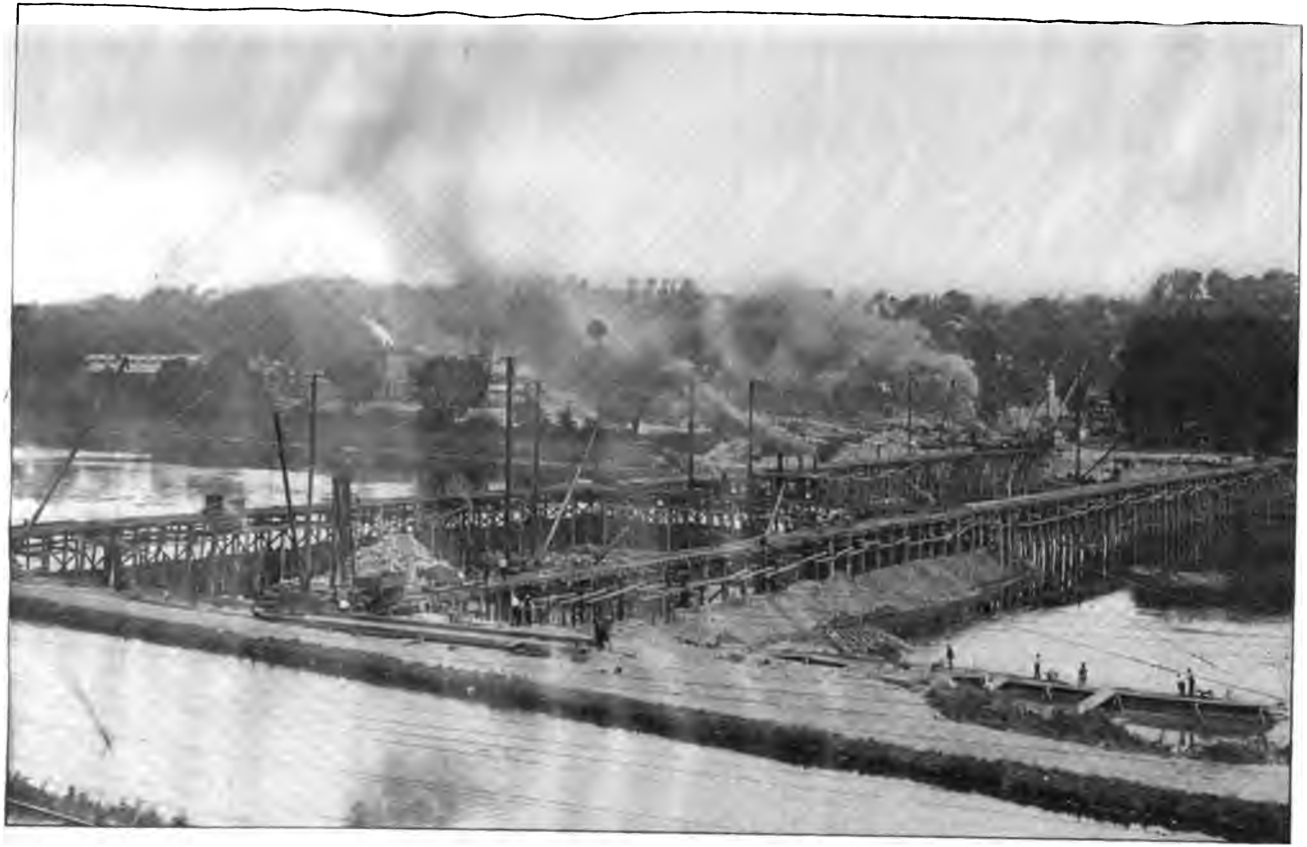
Earlier Appropriations.

I shall also request the Legislature to make available early in the session, a portion of the appropriation for improvements of roads that the contracts may be awarded and work commenced on same during 1908, and that the appropriation be not retarded to the end of the season as was the case this year when the money was placed at my disposal so late that the work could not be done in the same year.

Larger Annual Appropriations.

As it has been proven to me that numerous towns and counties desire more roads and that they be furnished to them more promptly than is possible under this year's appropriation, I shall request a sufficient appropriation by the State to bring the total amount, when combined with the county and town money, to $10,000,000. This year the amount appropriated by the State was $5,000,000, but so large a number of counties called upon the State to furnish the entire first cost that the total fund amounted to only about $7,500,000. Before February 1st I shall demonstrate that over seven and one-half million dollars worth of road work can very easily be advertised, bids received and contracts awarded in a season.

Next season several new counties will take advantage of the Higbie-Armstrong act, and to meet the increasing demand for a share of the fund at least $10,000,000 will be needed.



Barge Canal, Contract No. 17.
View of trestles and coffer-dams at Amsterdam, showing progress in excavating for lock and movable dam.

TESTING LABORATORY FOR STATE WORKS.

For many years the State Engineer's Department has included a testing laboratory where are made tests of all hydraulic cements used for State work, not only for the numerous works which are under the direction of the State Engineer, but also for those supervised by the State Architect, in the many buildings which he constructs. During the past year the character and importance of the work being done on the Barge canal has necessitated the addition of apparatus for testing sand submitted for use in the large concrete structures, and the magnitude of the improvements which the State has undertaken on its highways has led to the installation of another most valuable adjunct to this laboratory — a plant for testing the stone proposed for use in road-surfacing. The engineer who is in charge of this general testing laboratory has made visits to many of the best-equipped laboratories in this country and at all times keeps fully informed as to the latest and most-approved methods.

Although the laboratory for testing cement was enlarged two years ago, the great amount of work being done on the Barge canal and on the public highways has made it necessary again to increase its capacity. The methods of testing are in accord with the latest and best practice and insure the use of none but the best cements for State work. The high grade of requirements has been maintained during the year, thus keeping up with the improved methods and products of American manufacturers of Portland cement.

The work of testing sand has not been in progress long, but the results already demonstrate the wisdom of making this addition to the laboratory.

The apparatus for testing stone has just been installed and the work is about to begin. The extent of highway improvement over the whole state and the great variety of possible road metal found in the several localities have necessitated this departure, so as to protect the State from the liability of expending large sums on improvements that will not be durable. With this plant, also, the important work of testing stone for use in the large concrete structures of the Barge canal will be performed. But one laboratory in the country will be as complete in its machinery for testing stone — the one connected with the Office of Public Roads, U. S. Department of Agriculture, at Washington, D. C.

With all of this new equipment, the testing laboratory of this Department becomes one of the most complete of its kind in the country.

COURT OF CLAIMS SURVEYS.

In order that the Court of Claims may have full knowledge of the claims which are brought before them for damages alleged to have been caused by the canal and by its works, engineers of this Department have made and presented surveys, maps and photographs on behalf of the State, and the evidence thus produced has resulted in saving to the State much money.

Detailed description of the work thus done will be found in the appended reports of the division engineers.

It is recommended that the Legislature appropriate $5,000 for the continuation of this work.

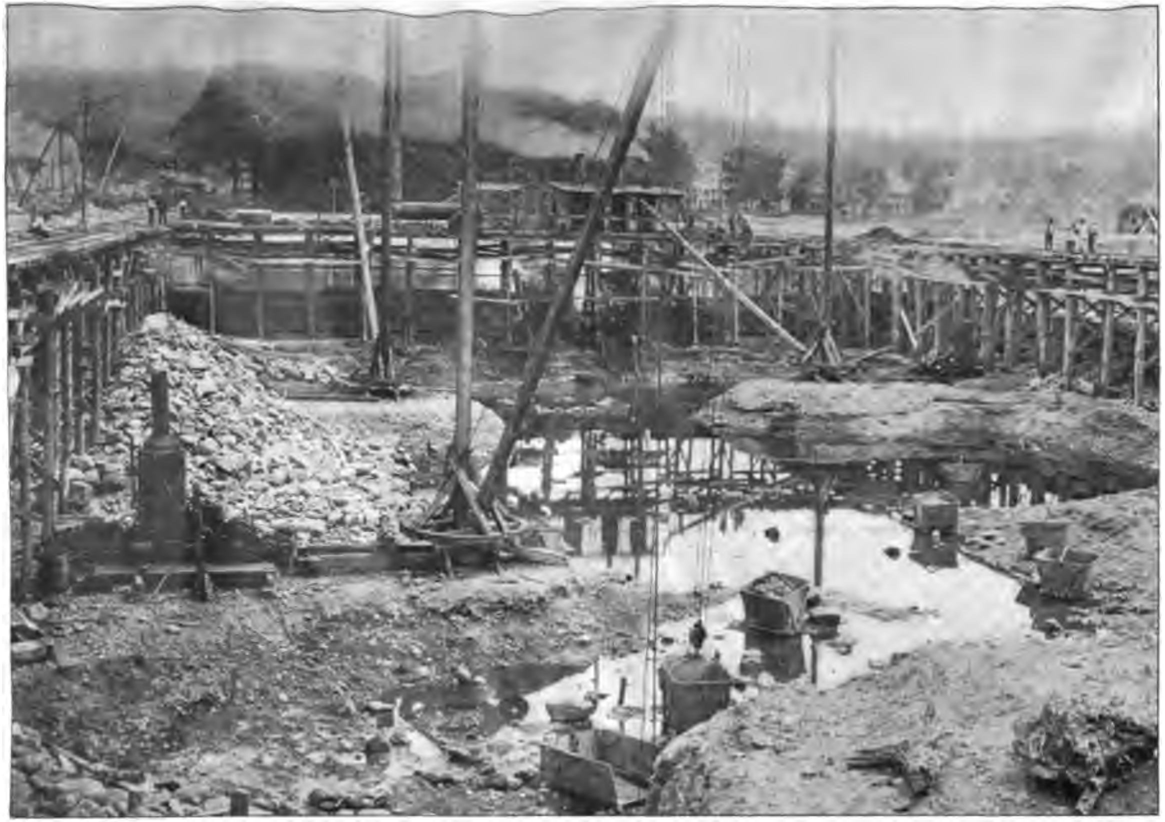
LAND BUREAU.

This Bureau of the State Engineer's Department has charge of the sale of State land under water and of the custody and care of ancient records. The ancient records of this Department, as well as the modern ones, are of great value for reference, and it has been the policy through recent years to add to them whenever this can be done without cost to the State.

BUREAU OF BRIDGES.

This Bureau was established in 1899 by an act of the Legislature (chapter 476), which provided for a chief bridge designer and necessary assistants. The bureau was required at that time on account of the growing demand for lift-bridges over the canals, which, because of the intricate character of their design, had come to be planned by various private engineering and bridge-contracting firms. The formation of this bureau has resulted in a uniformity of design in bridges which had been lacking when designed by private firms, bringing the preparation of plans and the inspection of construction entirely within the control and knowledge of this Department.

Since the commencement of making plans for the Barge canal project, this bureau has become absolutely necessary; its size and scope have been largely increased; now it has supervision of preparing plans, specifications and estimates for the construction of bridge superstructures, substructures, and approaches, lock-gates,



Barge Canal, Contract No. 17.
View within the south coffer-dam, at Amsterdam, showing progress in excavating for the south end of a movable dam (No. 7).

lock-valves, needle-dams, movable-dams and other forms of steel structures required for building the Barge canal.

The bridges over existing canals in the state often call for expert inspection and this is performed by the bureau of bridges upon request from the Superintendent of Public Works. If repairs are necessary, plans also are furnished by the bureau.

By the provision of section 145 of the Highway Law, town officials may avail themselves of the services of this bureau in inspecting and certifying to the proper construction of iron or steel bridges exceeding 200 feet in length, or having a span or spans exceeding 100 feet in length, before the structure is accepted and paid for. If the plans and specifications for these bridges are submitted to the State Engineer for his approval, the bridge bureau is charged with their examination. It also has the duty of similarly examining plans submitted by electric and steam railway companies for new bridges over the canals, or for strengthening existing bridges.

The provisions of section 145 of the Highway Law, of which I have just spoken, are usually evaded in practice and afford very little protection to the taxpayers of the various towns. For several years this Department has advised a change in the law, and I repeat the recommendation that it be amended in such a way as to require the approval by the county engineer, where there is one, and by the State Engineer, of the plans and specifications of every bridge exceeding $500 in cost that is contracted for by the town. Also, that after the approval of such plans, the contract for every bridge be awarded to the lowest responsible bidder, based upon the approved plans therefor, after the same have been properly advertised in two papers published in the county in which the bridge is located, and also in some paper devoted to engineering and contract work and published within the state. The amendment should provide that the contractor shall not be paid for any bridge until the final account for the structure has received the approval of a majority of the members of the town board, the county engineer and the State Engineer.

STATE BOUNDARY LINES.

By chapter 678 of the Laws of 1892, the State Engineer and Surveyor is authorized and directed to make an examination every three years of all of the monuments marking the boundary lines of the state; if any such monuments be found injured, missing or displaced, he is directed — acting in conjunction with the duly recognized authorities of the adjoining state — to replace such monuments. The total length of the State boundary line is 1,416 miles, comprised as follows: Canada line, 431 miles; Vermont line, 171 miles; Massachusetts line, 50½ miles; Connecticut line to Long Island Sound, 81 miles; along the ocean around Long Island to the New Jersey shore, 246 miles; New Jersey line, 92½ miles; Pennsylvania line, 344 miles to the beginning of the Canada line in the middle of Lake Erie. These boundaries are fixed by accepted agreements and are marked by natural water-courses or by monuments.

The only line examined during the past year was that between New York and Vermont.

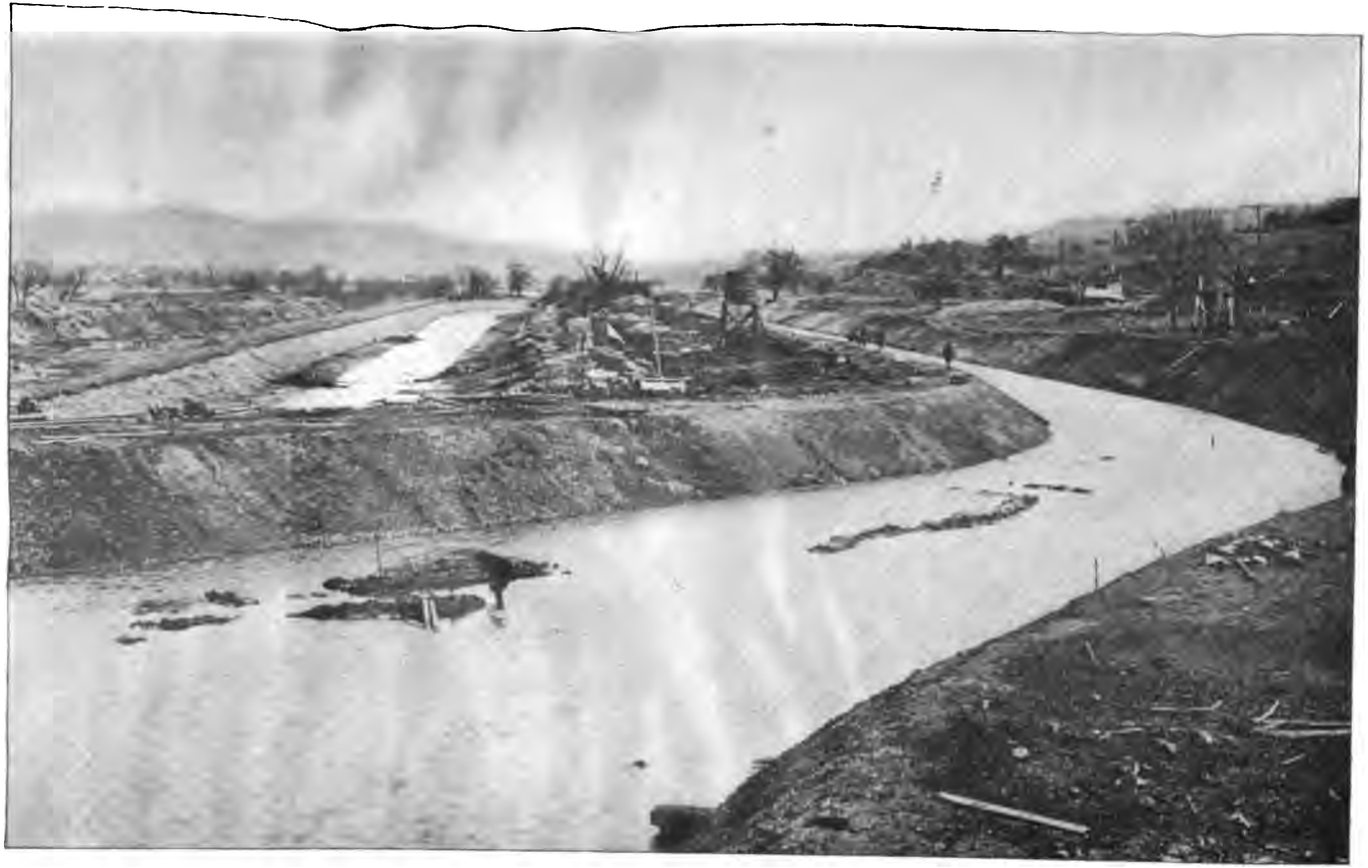
From the most recent investigations of men assigned for the purpose by this Department, it appears that nearly all of the monuments in the state boundary line are in a satisfactory condition except those along the Connecticut line. The New York-Connecticut division line, from Long Island Sound to the southerly boundary of Massachusetts, a distance of about 80 miles, was in dispute for nearly 200 years, or until 1860. Then it was established by a commission representing the State of New York, and was marked by a hundred marble or iron monuments, but their condition has been unsatisfactory for several years. My predecessors have tried repeatedly to induce the proper authorities of Connecticut to coöperate with New York in remonumenting this line, and I have continued in a like attempt, but as yet without success. This matter calls for speedy attention, but I have no authority to act, nor do I deem it wise to do so, even if I were clothed with the power to proceed, unless assurance of coöperation were furnished by the Connecticut authorities.

CO-OPERATIVE SURVEY OF STATE.

Survey of New York State in Coöperation with the United States Geological Survey.

TOPOGRAPHIC SURVEY.

The annual reports of this Department for several years prior to 1893 urged the passage of an act to provide for the coöpera-



Barge Canal, Contract No. 18.

View near Mindenville, showing the present Erie canal and a temporary canal constructed so as to allow operations for the Barge canal to be carried on at the site of the existing canal.

tion of the State of New York with the United States Government for the purpose of securing an accurate topographic survey and map of the State of New York, which recommendation was finally adopted and the work authorized by chapter 287, Laws of 1893. From 1893 to the present time the work has been steadily progressed and is now rapidly approaching completion. The agreement between the United States Geological Survey,— the department having the matter in charge for the Federal Government — and the State Engineer's Department, acting on behalf of New York State, is that each shall pay one-half the expense of the surveys and the Federal Government shall pay all of the expense of engraving plates and printing the maps therefrom. The State's share of the cost is provided by annual appropriations by the Legislature, the United States Government contributing dollar for dollar to an amount equal to the appropriation made by the State.

The maps are printed in sheets about 20 inches by 16½ inches in size, on a scale of about one inch to the mile, and show all roads, waterways, mountains, hills and valleys, railroads, towns, villages, cities, etc. The state has been divided into 260 quadrangles, each shown on one sheet.

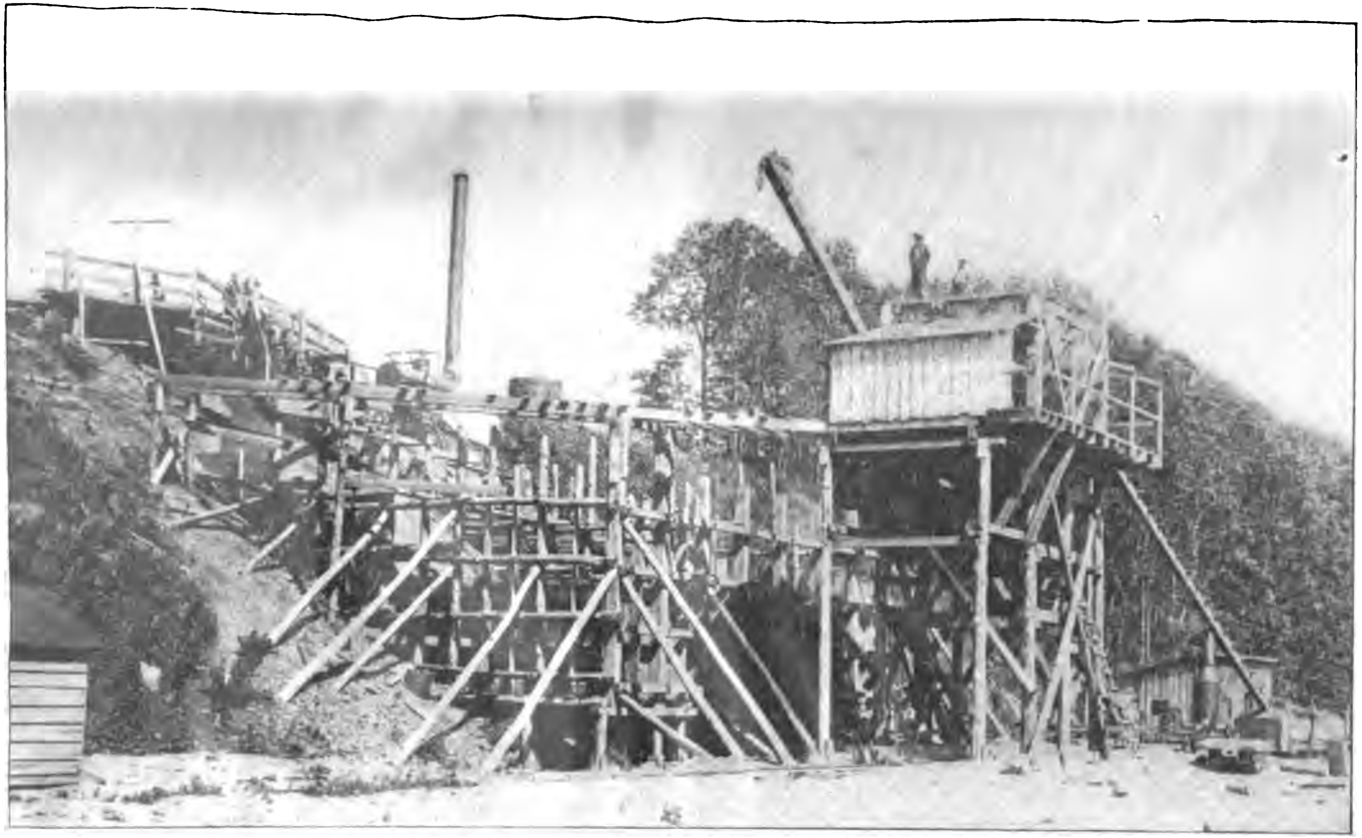
No other map of the state has ever been published upon such a large scale nor in such detail, and the information afforded by these maps is of great value to the citizens at large and especially to several of the State departments — in connection with the work of highway improvement and with the operation of the Forest Preserve Board, and also in examinations which are constantly being made for water-supplies for existing and proposed canals and for the various cities and towns. These maps are in constant and growing demand by those who are planning any kind of work of improvement in the state, giving as they do the means of making, without the delay and expense of special field-work, preliminary locations for water-storage and water-power development, railroad lines and highway improvement. The State has thus obtained maps of great usefulness and value at less than half their actual cost.

In 1905 the Legislature of the State failed to appropriate the customary sum of $30,000 for the coöperative survey and during that year the Federal Government transferred a portion of its available funds to the work in other states. Upon the resumption of appropriations by the State in 1906 it was found that only about $10,000 remained available as the share of the United States to continue the work. A like amount of $10,000 is therefore recommended as the proper appropriation for the purpose by the present Legislature.

HYDROGRAPHIC SURVEY.

Since 1900 there has existed a coöperative agreement between New York State and the United States Government to engage in making measurement of the volume of streams and flow of water, each bearing one-half of the expense. With the exception of 1905 this work has been carried on jointly. In 1905 the State failed to make the usual appropriation and the United States Government assumed the whole expense, but discontinued several of the gaging stations which had been maintained chiefly for the benefit of the State. In that year no report of the gagings was made to this Department, but through the courtesy of the Director of the United States Geological Survey, portions of the Government report were reprinted, so as to preserve the continuity of State reports on stream-gaging.

Soon after the beginning of surveys for the Barge *canal* a bureau of hydrography was established at the head office, and for the past two years this has been in charge of Robert E. Horton, Resident Engineer, formerly District Hydrographer of the United States Geological Survey for this section of the country. When the coöperative measurements were resumed in 1906 by New York and the United States Government, the Barge canal bureau retained the gaging stations it had assumed and the number of these stations has now become about one hundred. The elevations of water-surfaces, corresponding to gage readings, at all of these stations have been reduced to one datum (Barge canal datum) and the discharge measurements of a considerable number of gagings have been calculated. This bureau has become one of the indispensable adjuncts of this Department, for the results of its observations are necessary in properly designing plans for building the Barge canal. These records are also of great service in determining values for properties acquired or damages sustained. They are useful, too, in considering propo-



BARGE CANAL, CONTRACT NO. 8.
View of sand-washer at Rotterdam Junction.

sitions for water-power and storage, and extensive studies, based on these gagings, have already been made for propositions of this character. Certain stations serve as measures of protection to guard State interests and others against approaching floods. The bureau has taken over several stations formerly maintained by the United States Government or by individuals or corporations, in order that long-existing records may be continued permanently and without interruption, for the value of gaging records increases with their duration, and only from observations of many years can accurate averages be determined and extremes of low water and floods be ascertained. On June 1, 1907, eleven of these gaging stations were taken from the United States Geological Survey, which now maintains thirty-four stations in this state.

Mr. H. K. Barrows, District Hydrographer, with an office at Boston, Mass., now has charge of the coöperative measurements. I recommend that the usual amount — $1,500 — be appropriated by the Legislature for the continuation of this joint work.

CONCLUSION.

It will be seen from the foregoing report that this Department is one of the most important in the State Government. To its supervision are intrusted some of the greatest interests of the State. The magnitude of these interests and of the engineering problems involved is easily discernible. During the past year the dignity and importance of this Department, as one of the great executive offices of this Empire State, have been sedulously guarded and maintained.

The appended reports of the division engineers and of the various heads of bureaus will give in detail an account of the work performed during the fiscal year, and will set forth more fully the features of the large enterprises, whose supervision devolves upon this Department.

The work of this Department was under the direction of my predecessor, Hon. Henry A. Van Alstyne, to the end of the calendar year 1906; since that date it has been under my charge. Mr. Edmund F. Van Hoesen acted as Deputy State Engineer until February 1, 1907; since then Mr. Frank L. Getman has filled that office; these men have had general direction of all work except that connected with the Barge canal. Mr. Henry C. Allen served as Special Deputy State Engineer till January 1, 1907; thereafter Mr. William R. Hill occupied that position; to these men was intrusted the supervision of the Barge canal improvement.

In closing this report I desire to express my appreciation of the courtesies and assistance accorded me by the several State officers and members of the Legislature in the administration of my official affairs, and to acknowledge the ability and faithfulness of the men under my charge in performing the work of the Department.

Respectfully submitted,
FREDERICK SKENE,
State Engineer and Surveyor.

Engineering Expenses for the Fiscal Year Ending September 30, 1907.

Table of Contracts Completed During the Fiscal Year Ending September 30, 1907.

Table of Contracts Pending September 30, 1907.

Table of all Contracts Awarded for Highway Improvement under Chapter 115, Laws of 1898, and Amendments Thereto.

Engineering Expenses for Fiscal Year Ending September 30, 1907.

Ordinary Repairs to Canals.

WORK.	ACT.		Division.	Amount.	Total.
	Chap.	Year.			
Erie canal....................	683	1906	Eastern..	$10,064 17	$12,000 00
Champlain canal..............	683	1906	Eastern..	1,935 83	
Erie canal....................	683	1906	Middle...	$8,898 07	9,000 00
Oswego canal..................	683	1906	Middle...	11 50	
Cayuga and Seneca canal......	683	1906	Middle...	58 43	
Black River canal............	683	1906	Middle...	32 00	
Erie canal....................	683	1906	Western..	$8,889 50	8,889 50
Total....................	.....	......	....	....	$29,889 50

Construction of Barge Canal.

WORK.	ACT.		Division.	Amount.	Total.
	Chap.	Year.			
Barge canal, head office account.	147 143 172	1903 1905 1907	Eastern...	$214,236 24	$356,946 66
Erie.............	147 143 172	1903 1905 1907	Eastern...	84,028 48	
Champlain.........	147 143 172	1903 1905 1907	Eastern...	58,681 94	
Barge canal, Erie.............	147 143 172	1903 1905 1907	Middle....	$68,472 95	87,996 52
Oswego..........	147 143 172	1903 1905 1907	Middle....	19,523 57	
Barge canal, Erie.............	147 143 172	1903 1905 1907	Western...	$61,179 76	61,179 76
Total...................	.....	......	....	....	$506,122 94

Improvement of Public Highways.

WORK.	ACT.		Division.	Amount.	Total.
	Chap.	Year.			
Highway improvement........	115	1898	Eastern...	$284,043 48	
Maintenance and repairs........	115 468 686 170	1898 1906 1906 1907	Eastern...	81,141 77	$365,185 25
Highway improvement.........	115 468	1898 1906	Middle....	$113,708 81	
Maintenance and repair.......	115 468 686	1898 1906 1906	Middle...	11,366 87	125,075 68
Highway improvement.......	115 468	1896 1906	Western...	$78,606 44	
Maintenance and repair........	115 468 170	1898 1906 1907	Western...	54,244 43	132,850 87
Total....................	......	......	....	....	$623,111 80
"Money System," repair of highways..................	700 686	1905 1906	Eastern...	$31,143 07	$31,143 07

Special Work.

WORK.	ACT.		Division.	Amount.	Total.
	Chap.	Year.			
Bridge, North Salina street, Syracuse..................	688	1906	Middle....	$658 20	
Dam, Brasher Falls—St. Regis river....................	230 686	1906 1906	Middle....	252 25	
Total....................	.....	......	....	....	$910 45

Bureau of Bridges.

WORK.	ACT.		Division.	Amount.	Total.
	Chap.	Year.			
Bureau of bridges.............	686 578	1906 1907	Eastern...	$977 12	
Total....................	.....	......	....	....	$977 12

Special Surveys.

WORK.	ACT.		Division.	Amount.	Total.
	Chap.	Year.			
Examination of monuments and maps	729 686	1904 1906	Eastern	$828 49	
Court of Claims surveys	686 578	1906 1907	Eastern	2,101 27	
Topographic survey	686 578	1906 1907	Eastern	5,028 00	
Hydrographic survey	686 578	1906 1907	Eastern	1,556 28	$9,514 04
Court of Claims surveys	700 686	1905 1906	Middle	$3,007 62	3,007 62
Court of Claims surveys	700	1905	Western	$1,957 60	1,957 60
Total	.....	......	....	....	$14,479 26

Summary of Engineering Expenses for Fiscal Year Ending September 30, 1907.

DIVISION.	Ordinary repairs to canals.	Construction of Barge canal.	Improvement of public highways.	Money system.	Special work.	Bureau of bridges.	Special surveys.	Total.
Eastern	$12,000 00	$356,946 66	$365,185 25	$31,143 07	....	$977 12	$9,514 04	$775,766 14
Middle	9,000 00	87,996 52	125,075 68	....	$910 45	....	3,007 62	225,990 27
Western	8,889 50	61,179 76	132,850 87	....	....	....	1,957 60	204,877 73
Totals	$29,889 50	$506,122 94	$623,111 80	$31,143 07	$910 45	$977 12	$14,479 26	$1,206,634 14

TABLE OF CONTRACTS COMPLETED DURING THE FISCAL YEAR ENDING SEPTEMBER 30, 1907.

CONTRACTOR.	Date of contract.	Character of work.	Division.	ACT.		Appropriation.	Contract price.	Final payments.
				Chap.	Year.			
B. P. Clark	Aug. 22, 1906	Constructing a new apron and repairing State Dam at Brashers Falls	Middle	729 700 230 686	1904 1905 1906 1906	$5,510 03	$5,038 25	$4,737 66
H. W. Fisher	June 13, 1907	Constructing a vertical retaining wall on the Oneida feeder, Oneida	Middle	686	1906	4,500 00	4,114 77	3,992 55

Improvement of Public Highways.

Chapter 115, Laws of 1898, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Contract price.	Final payments.
Ganung & Hoyt	June 19, 1903	Turk Hill–Putnam county line road, No. 151, Westchester county	Eastern	$55,200 00	$55,484 26
D. I. Snell & Co.	Nov. 7, 1906	Fonda–East road, No. 152–A, Montgomery county	Eastern	3,185 43	3,191 43
The Orange County Road Construction Co.	Sept. 1, 1906	Chester–Goshen road, No. 156–A, Orange county	Eastern	425 00	597 00
Alonzo Schaupp	Sept. 1, 1906	Northampton road, No. 158, Montgomery county	Eastern	6,590 00	6,809 63
The Orange County Road Construction Co.	June 18, 1904	Slate Hill–Unionville road, No. 160, Orange county	Eastern	45,200 00	46,301 05
John H. Gordon	Oct. 16, 1906	Delaware Turnpike road, No. 178–A, Albany county	Eastern	3,000 00	3,025 00
Alonzo Schaupp	Nov. 7, 1906	Mohawk River Turnpike road, 180–A, Montgomery county	Eastern	892 60	891 50
Joseph Walker	May 29, 1906	River road, No. 193–A, Albany county	Eastern	4,800 00	7,105 69
Thomas H. Karr	June 23, 1904	Wynantskill–West Sand Lake road, No. 195, Rensselaer county	Eastern	33,400 00	35,180 18
Edward Rendert	Aug. 18, 1906	East Nassau road, No. 196–A, Rensselaer county	Eastern	677 50	677 50
William H. Masterson	June 13, 1904	Troy–Poestenkill road, No. 201, Rensselaer county	Eastern	26,694 12	27,558 34
John Schuman, Jr.	Dec. 13, 1906	Troy–Poestenkill road, No. 201–A, Rensselaer county	Eastern	2,920 00	2,938 52
John E. Consalus	Dec. 7, 1906	Kingston–Saugerties road, No. 228–A, Ulster county	Eastern	3,654 00	3,447 50
The Clinton Beckwith Engineering and Contracting Co.	July 9, 1906	Old State road, No. 232, Essex county	Eastern	18,000 00	18,904 55
The Buckley Construction Co.	July 6, 1906	Old Plank road, No. 249, Fulton county	Eastern	24,800 00	25,488 74
Andrews Brothers	July 10, 1906	Birch Hill road, No. 270, Nassau county	Eastern	10,172 69	10,639 88
John H. Gordon	July 3, 1906	Troy–Sand Lake (section 2) road, No. 288, Rensselaer county	Eastern	14,500 00	15,252 58
Joseph Walker	July 11, 1906	De Graff's Corners–Sherburne's Corners road, No. 300, Montgomery county	Eastern	9,800 00	9,727 58
The Clinton Beckwith Engineering and Contracting Co.	July 9, 1906	Minaville–Scotch Bush road, No. 301, Montgomery county	Eastern	15,000 00	14,495 93
D. I. Snell & Co.	July 9, 1906	Fonda–Berryville road, No. 302, Montgomery county	Eastern	14,320 00	15,848 39
Siver & Gould	July 10, 1906	Colliersville–Emmons road, No. 316, Otsego county	Eastern	10,716 00	11,667 85
S. B. Van Wagonen	June 30, 1906	Colliersville–Milford Center road, No. 318, Otsego county	Eastern	16,500 00	17,021 15
The General Construction Co.	July 7, 1906	Pawling–Patterson road, No. 343, Dutchess county	Eastern	21,915 00	21,787 47
The Lane Construction Corporation	July 9, 1906	Millerton–North East Center road, No. 344, Dutchess county	Eastern	16,000 00	16,234 01

TABLE OF CONTRACTS COMPLETED DURING THE FISCAL YEAR ENDING SEPTEMBER 30, 1907—(Continued).

Improvement of Public Highways —(Continued).

Chapter 115, Laws of 1898, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Contract price.	Final payments.
Alonzo Schaupp	July 2, 1906	Poland–Cold Brook road, No. 360, Herkimer county	Eastern	$3,740 00	$3,739 53
James H. Malcolm	July 3, 1906	Guilderland Center–Guilderland road, No. 365, Albany county	Eastern	14,088 14	14,938 61
Joseph Walker	July 11, 1906	New Scotland–Wolf Hill road, No. 366, Albany county	Eastern	58,500 00	70,831 66
The Buckley Construction Co.	July 6, 1906	Glenmont–Feura Bush road, No. 367, Albany county	Eastern	48,460 00	57,706 94
Andrews Brothers	July 10, 1906	Arrandale–Bay View road, No. 434, Nassau county	Eastern	11,026 26	15,283 67
Peace Brothers	Sept. 1, 1906	South Glenwood–Meeting House road, No. 435, Nassau county	Eastern	17,500 00	20,374 06
The Lane Construction Corporation	July 9, 1906	Northeast Center–Sharon Station road, No. 534, Dutchess county	Eastern	31,600 00	31,184 54
Hinman & Sproul	Aug. 28, 1906	Violet Avenue–East Park road, No. 550, Dutchess county	Eastern	14,999 00	15,578 97
McNamee & Rice	July 10, 1906	Fishkill–Hughsonville road, No. 551, Dutchess county	Eastern	22,000 00	23,851 91
Jeremiah T. Finch	July 9, 1906	Schenectady–Guilderland road, No. 577, Schenectady county	Eastern	48,287 00	51,875 79
County of Broome	June 16, 1904	Endicott road, No. 174, Broome county	Middle	19,900 00	20,638 20
County of Broome	June 16, 1904	Center Village road, No. 211, Broome county	Middle	4,749 00	4,486 84
County of Broome	June 16, 1904	Ouaquaga road, No. 212, Broome county	Middle	8,249 00	8,007 92
County of Broome	June 16, 1904	River road, Windsor (section 2), No. 213, Broome county	Middle	22,999 00	28,221 39
County of Broome	July 16, 1904	River road, Windsor (section 1), No. 214, Broome county	Middle	12,794 00	14,023 44
Douglas V. Ashley	July 13, 1904	Guilford road, No. 225, Chenango county	Middle	41,348 00	42,604 72
Brennan & O'Brien	July 9, 1906	Sacketts Harbor road, No. 237, Jefferson county	Middle	10,887 00	11,212 62
County of Broome	July 12, 1906	Bridge road, No. 268, Broome county	Middle	9,053 68	9,724 43
Casey & Murray	July 10, 1906	Mohawk River road, Deerfield, No. 297, Oneida county	Middle	31,450 00	38,199 17
The Barnett Contracting Co.	Sept. 18, 1906	Minetto road, No. 370, Oswego county	Middle	6,170 00	6,054 48
Chas. H. Quereau	July 10, 1906	Cincinnatus road, No. 377, Cortland county	Middle	3,650 00	3,614 41
Celestin C. Burns	July 7, 1906	Watertown–Carthage (section 2) road, No. 427, Jefferson county	Middle	37,256 00	38,018 85
J. Charles Dayton	July 20, 1906	Jordan Valley (section 1) road, No. 430, Onondaga county	Middle	13,797 00	13,916 37
Douglas V. Ashley	July 10, 1906	Cortland–Groton (section 1) road, No. 446, Cortland county	Middle	9,782 00	9,634 68
J. Francis Ward	Aug. 1, 1906	Additional work, State road, No. 185, Jefferson county	Middle	1,215 00	1,215 00
J. Francis Ward	Aug. 1, 1906	Repair contract No. 4, road No. 147, Jefferson county	Middle	2,500 00	2,502 05
John Johnson	July 10, 1906	Reeds Corners road, No. 206, Ontario county	Western	18,700 00	19,375 07
Henry P. Burgard	July 14, 1906	Geneva–Canandaigua (section 2) road, No. 207, Ontario county	Western	45,000 00	49,387 02

Mosler & Summers	July 5, 1906	Griswold St. road, No. 251, Niagara county	Western	17,500 00	17,507 23
Frederick A. Brotsch	July 11, 1906	Clifton (section 2) road, No. 252, Monroe county	Western	18,000 00	19,810 85
Frederick A. Brotsch	July 11, 1906	Little Ridge (section 4) road, No. 257, Monroe county	Western	23,000 00	23,844 80
John Johnson	July 10, 1906	Orchard Park (section 5) road, No. 272, Erie county	Western	12,000 00	12,784 21
Greece Construction Co	July 13, 1906	Barnards Crossing (sections 1 and 2) road, No. 276, Monroe county	Western	34,900 00	36,235 25
Henry C. Schroeder	July 10, 1906	Geneva–Canandaigua (section 3) road, No. 333, Ontario county	Western	8,242 44	8,497 65
Henry C. Schroeder	July 10, 1906	Lyons–Geneva road, No. 334, Ontario county	Western	12,465 50	13,594 05
Mosler & Summers	July 5, 1906	Victor–Mendon (section 1) road, No. 335, Ontario county	Western	36,400 00	37,886 17
Costello & Nagle	Sept. 13, 1906	Grand Central Avenue road, No. 357, Chemung county	Western	14,250 00	14,425 30
McCarthy & Simperson	July 11, 1906	Dansville–Mt. Morris (section 3) road, No. 482, Livingston county	Western	22,850 00	24,088 59
Chambers & Grady	July 9, 1906	Canandaigua–Victor road, No. 484, Ontario county	Western	44,135 00	44,787 41
F. W. Knickenberg	June 30, 1906	Clarence–Hunts Corners road, No. 522, Erie county	Western	31,300 00	35,659 62

TABLE OF CONTRACTS PENDING SEPTEMBER 30, 1907.

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Engineer's preliminary estimate.	Contract price.	Payments to Sept. 30, 1907.
Empire Engineering Corporation	April 18, 1905	Contract No. 1, Champlain canal	Eastern	$619,846 00	$605,008 40	$256,788 00
Ferguson Contracting Co	April 3, 1905	Contract No. 2, Erie canal	Eastern	1,022,640 00	852,320 00	286,893 00
John W. Flynn	May 10, 1905	Contract No. 2-A, Erie canal	Eastern	—4,810 00	—7,550 00	—7,550 00
John W. Flynn	May 10, 1905	Contract No. 2-B, Erie canal	Eastern	—1,290 00	—1,005 00	—1,005 00
Sundstrom & Stratton	April 4, 1905	Contract No. 3, Champlain canal	Eastern	760,576 00	670,497 00	420,156 00
Sundstrom & Stratton	Oct. 3, 1905	Contract No. 3-A, Champlain canal	Eastern	—1,615 00	—300 00	—300 00
The Groton Bridge Co	Aug. 10, 1906	Contract No. 7, Erie and Champlain canals	Eastern Middle Western	102,122 70	97,635 20	21,492 00
Pittsburg-Eastern Co	May 22, 1906	Contract No. 8, Erie canal	Eastern	1,518,382 00	1,433,817 00	103,446 00
Fort Orange Construction Co	May 21, 1906	Contract No. 11, Erie canal	Eastern	1,671,385 00	1,359,475 00	140,121 00
Acme Engineering and Contracting Co	Sept. 10, 1907	Contract No. 14, Erie canal	Eastern	2,875,570 00	2,935,763 00	....
Atlantic, Gulf & Pacific Co	Aug. 9, 1906	Contract No. 15, Champlain canal	Eastern	1,380,760 00	1,509,060 00	91,161 00
United Construction Co	Dec. 20, 1906	Contract No. 16, Erie and Champlain canals	Eastern	70,718 00	63,472 00	....
The Scofield Co	Dec. 29, 1906	Contract No. 17, Erie canal	Eastern	883,926 00	835,725 00	40,167 00
O'Brien & Hoolihan Contracting Co	Dec. 28, 1906	Contract No. 18, Erie canal	Eastern	789,440 00	859,460 00	68,787 00
Atlantic, Gulf & Pacific Co	Nov. 19, 1906	Contract No. 25, Champlain canal	Eastern	1,849,831 00	1,754,236 00	42,894 00
Kinser Construction Co	Nov. 23, 1906	Contract No. 27, Champlain canal	Eastern	998,920 00	972,210 00	32,409 00
M. Fitzgerald	Aug. 8, 1906	Contract No. 34, Erie canal	Eastern	22,604 00	20,611 50	11,781 00
Empire Engineering Corporation	April 18, 1905	Contract No. 4, Erie canal	Middle	812,560 00	726,815 00	148,572 00
Empire Engineering Corporation	April 18, 1905	Contract No. 5, Erie canal	Middle	421,252 50	381,987 50	104,679 00
The Groton Bridge Co	Aug. 10, 1906	Contract No. 7, Erie canal	Middle	39,883 30	38,125 80	....
Mosier & Summers	June 7, 1906	Contract No. 10, Oswego canal	Middle	1,149,988 00	1,126,718 00	64,107 00
Stewart-Kerbaugh-Shanley Co	Sept. 23, 1907	Contract No. 12, Erie canal	Middle	3,082,560 00	3,391,716 00	....
Gilmour-Horton-Allen Co	Sept. 16, 1907	Contract No. 35, Oswego canal	Middle	752,760 00	739,261 00	....
F. A. Maselli & Co	May 8, 1905	Contract No. 6, Erie canal	Western	1,588,912 00	1,005,952 50	381,069 00
The Groton Bridge Co	Aug. 10, 1906	Contract No. 7, Bridges on Contract No. 6	Western	....	27,337 80	....
The Great Lakes Construction Co	Nov. 26, 1906	Contract No. 19, Erie canal	Western	1,038,245 00	1,002,170 75	18,162 00

Improvement of Public Highways.

Chapter 115, Laws of 1898, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Engineer's preliminary estimate.	Contract price.	Payments to Sept. 30, 1907.
The Orange County Road Construction Co.	July 20, 1906	Chester–Vail's Gate road, No. 154–A, Orange county	Eastern	$25,509 00	$25,833 00	$23,766 36
The Orange County Road Construction Co.	July 20, 1906	Woodbury–Central Valley road, No. 157, Orange county	Eastern	24,330 00	18,367 80	17,933 02
The Orange County Road Construction Co.	June 18, 1904	Newburgh–Shawangunk road, No. 161, Orange county	Eastern	54,120 00	48,250 00	67,298 70
Corliss Construction Co.	July 9, 1906	Brunswick Turnpike road, No. 227, Rensselaer county	Eastern	30,700 00	25,900 00	22,515 30
John E. Consalus	June 29, 1906	Saugerties–Kingston road, No. 228, Ulster county	Eastern	55,700 00	40,800 00	52,110 90
Stewart–Kerbaugh–Shanley Co.	Oct. 1, 1906	Kingston–High Falls road, No. 229, Ulster county	Eastern	82,300 00	57,000 00	....
Joseph Walker	July 11, 1906	Kingston–Ellenville (section 1) road, No. 230, Ulster county	Eastern	88,200 00	63,439 00	12,053 41
McNamee & Rice	July 7, 1906	Post (section 1) road, No. 231, Ulster county	Eastern	71,100 00	52,250 00	44,201 85
The Clinton Beckwith Engineering and Contracting Co.	July 9, 1906	Frankfort–East Schuyler road, No. 233, Herkimer county	Eastern	14,300 00	12,700 00	12,563 35
Morris Kantrowitz	Aug. 30, 1906	Delhi–Middletown road, No. 239, Delaware county	Eastern	53,300 00	46,775 00	34,613 50
John W. Flynn	July 3, 1906	Cohoes–Waterford road, No. 240, Saratoga county	Eastern	24,432 41	21,138 40	19,323 29
Schenectady Contracting Co.	July 13, 1906	Saratoga–Ballston road, No. 241, Saratoga county	Eastern	40,370 00	30,669 00	14,107 54
Saratoga Trap Rock Co.	July 13, 1906	Saratoga–Glens Falls (section 2) road, No. 242, Saratoga county	Eastern	9,820 00	8,513 40	8,300 06
The Clinton Beckwith Engineering and Contracting Co.	July 9, 1906	Mechanicville–Stillwater road, No. 243, Saratoga county	Eastern	21,300 00	18,000 00	4,884 00
The Clinton Beckwith Engineering and Contracting Co.	July 9, 1906	Saratoga–Schuylerville road, No. 244, Saratoga county	Eastern	59,550 00	55,000 00	30,295 00
The Clinton Beckwith Engineering and Contracting Co.	July 9, 1906	Johnstown–Keck's Center (section 2) road, No. 247, Fulton county	Eastern	47,100 00	40,000 00	22,000 00
Robert Shafer	July 12, 1906	Gloversville–Meco–Phelps road, No. 246, Fulton County	Eastern	21,000 00	17,203 07	15,998 85
Schenectady Contracting Co.	Sept. 1, 1906	Gloversville–Broadalbin road, No. 248, Fulton county	Eastern	22,300 00	16,243 00	4,060 75
The Clinton Beckwith Engineering and Contracting Co.	July 9, 1906	Plattsburg–Keeseville (section 3) road, No. 258, Clinton county	Eastern	56,700 00	36,000 00	36,946 05
The Buckley Construction Co.	July 6, 1906	Plattsburg–Mooers (section 2) road, No. 259, Clinton county	Eastern	75,170 00	55,894 00	55,309 15
The Buckley Construction Co.	Aug. 1, 1906	Plattsburg–Mooers (section 3) road, No. 260, Clinton county	Eastern	43,660 00	33,000 00	14,520 00
The Scofield Co.	July 6, 1906	Peekskill–Salem Center (section 1) road, No. 261, Westchester county	Eastern	50,150 00	43,233 00	7,394 61
The Scofield Co.	July 6, 1906	Peekskill–Salem Center (section 2) road, No. 262, Westchester county	Eastern	41,250 00	33,711 00	31,688 34
Robert Shafer	July 12, 1906	Lake Pleasant–Speculator road, No. 277, Hamilton county	Eastern	33,900 00	24,443 40	3,345 71
De Graff & Hogeboom	Aug. 30, 1906	Greenville–Slate Hill road, No. 282, Orange county	Eastern	65,900 00	56,865 00	22,828 28
The Orange County Road Construction Co.	Sept. 4, 1906	Greenville–Port Jervis road, No. 283, Orange county	Eastern	72,000 00	57,350 00	22,366 50
Martin Murray	July 2, 1906	Averill Park–Crooked Lake road, No. 284, Rensselaer county	Eastern	37,440 00	27,660 00	21,305 70
Thomas H. Karr	July 7, 1906	Nassau–Brainard road, No. 285, Rensselaer county	Eastern	34,900 00	31,500 00	27,720 00
Morris Kantrowitz	Aug. 30, 1906	Rensselaer–Best road, No. 287, Rensselaer county	Eastern	43,750 00	35,349 00	28,632 69
E. M. & W. Ferguson	Sept. 3, 1907	Crescent Avenue road, No. 289, Suffolk county	Eastern	23,200 00	16,896 10	....
The Clinton Beckwith Engineering and Contracting Co.	July 9, 1906	Amsterdam–Hagaman road, No. 298, Montgomery county	Eastern	19,400 00	15,000 00	1,502 90
Joseph Walker	July 11, 1906	Saulwater's Corners–Young's Corners road, No. 299, Montgomery county	Eastern	29,100 00	27,000 00	24,933 50
Stewart–Kerbaugh–Shanley Co.	Sept. 3, 1907	Fonda–Tribe's Hill road, No. 303, Montgomery county	Eastern	20,900 00	18,705 95	....
Stewart–Kerbaugh–Shanley Co.	Sept. 3, 1907	Sprakers–Rural Grove road, No. 304, Montgomery county	Eastern	59,600 00	55,809 45	....

TABLE OF CONTRACTS PENDING SEPTEMBER 30, 1907 —(Continued).

Improvement of Public Highways — (Continued).

Chapter 115, Laws of 1898, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Engineer's preliminary estimate.	Contract price.	Payments to Sept. 30, 1907.
Town of Rochester	July 3, 1906	Kingston-Ellenville (section 2) road, No. 305, Ulster county	Eastern	$71,725 00	$56,500 00	$26,320 00
Stewart-Kerbaugh-Shanley Co	Sept. 3, 1907	Kingston-Ulster Landing road, No. 306, Ulster county	Eastern	58,100 00	51,927 30	....
Joseph Walker	Sept. 3, 1907	Plattekill-Modena road, No. 307, Ulster county	Eastern	73,100 00	58,579 00	....
The Orange County Road Construction Co	Sept. 4, 1906	Middletown-Cuddebackville (section 1) road, No. 312, Orange county	Eastern	42,100 00	36,400 00	19,656 00
Stewart-Kerbaugh-Shanley Co	Sept. 3, 1907	Middletown-Cuddebackville (section 2) road, No. 313, Orange county	Eastern	56,950 00	51,072 20	....
S. B. Van Wagonen	June 30, 1906	Gilbertsville-Mt. Upton road, No. 314, Otsego county	Eastern	46,900 00	37,000 00	17,390 00
The Clinton Beckwith Engineering and Contracting Co	July 9, 1906	Morris-Gilbertsville (section 1) road, No. 315, Otsego county	Eastern	32,700 00	26,000 00	20,699 25
Siver & Gould	July 10, 1906	Shady Side-Otego road, No. 317, Otsego county	Eastern	26,200 00	19,967 75	15,098 74
S. B. Van Wagonen	June 30, 1906	Schenevus-Maryland road, No. 319, Otsego county	Eastern	41,300 00	34,400 00	33,655 20
Bellew & Merritt	July 20, 1906	Peekskill-Salem Center (section 3) road, No. 331, Westchester county	Eastern	47,800 00	42,000 00	12,797 20
Bellew & Merritt	July 20, 1906	Peekskill-Salem Center (section 4) road, No. 332, Westchester county	Eastern	39,650 00	34,690 00	16,651 20
Buckley Construction Co	July 6, 1906	Saratoga-Corinth road, No. 340, Saratoga county	Eastern	63,500 00	51,000 00	30,303 45
John W. Polcaro	July 6, 1906	Stockport-Hudson road, No. 341, Columbia county	Eastern	30,150 00	23,100 00	15,939 00
John W. Polcaro	Aug. 28, 1906	Chatham-Chatham Center road, No. 342, Columbia county	Eastern	8,700 00	7,500 00	3,900 00
Charles R. Lewis	July 10, 1906	Frankfort-Utica (section 2) road, No. 359, Herkimer county	Eastern	18,700 00	14,600 00	9,845 60
Ulysses G. Stockwell	July 9, 1906	Johnstown-Tribes Hill (section 1) road No. 361, Fulton county	Eastern	24,000 00	20,149 00	18,738 57
Alonzo Schaupp	Sept. 3, 1907	Northville-Chapman's Corners road, No. 362, Fulton county	Eastern	16,900 00	15,346 70	....
Stewart-Kerbaugh-Shanley Co	Sept. 3, 1907	Mayfield-Northville (section 1) road, No. 363, Fulton county	Eastern	12,000 00	10,408 40	....
Robert Shafer	July 12, 1906	Preston Hollow-Potter Hollow road, No. 364, Albany county	Eastern	27,400 00	24,036 50	10,335 69
Stewart-Kerbaugh-Shanley Co	Sept. 3, 1907	Gloversville-Bull Run road, No. 376, Fulton county	Eastern	25,400 00	23,582 40	....
Robertson & Gerehart Construction Co	Sept. 3, 1907	Albany-Schenectady (section 2) road, No. 385, Albany county	Eastern	63,500 00	50,790 01	....
Stewart-Kerbaugh-Shanley Co	Sept. 4, 1907	Kitchawan-Croton Lake road, No. 405, Westchester county	Eastern	17,125 00	14,787 65	....
Malloy & Davis	Sept. 4, 1907	Troy-Schenectady (section 2) road, No. 407, Schenectady county	Eastern	37,400 00	34,225 77	....
Casey & Murray	July 10, 1906	Glens Falls-Lake George road, No. 417, Warren county	Eastern	84,700 00	72,500 00	57,936 95
Casey & Murray	July 10, 1906	Lake George-Bolton Landing road, No. 418, Warren county	Eastern	108,875 00	82,500 00	57,936 95
Lawlor & Haines	Aug. 31, 1906	Rhinebeck-Hyde Park road, No. 432, Dutchess county	Eastern	37,725 00	31,998 00	17,598 90
Buckley Construction Co	Sept. 1, 1906	Chazy-Chazy Landing-Ober's Corners road, No. 433, Clinton county	Eastern	38,925 00	33,987 00	1,019 61
Jeremiah T. Finch	Sept. 1, 1906	Jerico Turnpike-Plainview road, No. 436, Nassau county	Eastern	80,950 00	56,000 00	73,025 00
Russell Contracting Co	Sept. 4, 1907	Jerusalem Avenue-Front Street road, No. 437, Nassau county	Eastern	81,000 00	70,357 02	....
Stewart-Kerbaugh Shanley Co	Sept. 4, 1907	East Nassau-Brainard road, No. 439, Rensselaer county	Eastern	42,000 00	37,950 49	....

The Clinton Beckwith Engineering and Contracting Co.	Aug. 31, 1906	Saratoga-Glens Falls (sections 4 and 5) road, No. 441, Saratoga county	Eastern	74,700 00	59,987 00	34,792 46
Morris Kantrowitz	Sept. 4, 1907	Saratoga-Gansevoort road, No. 442, Saratoga county	Eastern	45,700 00	37,611 50	....
Stewart-Kerbaugh-Shanley Co.	Sept. 4, 1907	Saratoga-Greenfield-Schuylerville-Glens Falls road, No. 443, Saratoga county	Eastern	60,300 00	55,194 96	....
McNamee & Rice	July 10, 1906	Poughkeepsie-Hyde Park road, No. 453, Dutchess county	Eastern	52,450 00	38,000 00	....
Ulysses G. Stockwell	July 19, 1906	Little Falls-East Creek road, No. 456, Herkimer county	Eastern	61,500 00	48,919 00	20,069 09
Sylvester A. Seymour	July 9, 1906	Little Falls-Herkimer road, No. 457, Herkimer county	Eastern	65,700 00	55,950 00	27,493 50
J. H. Nelson & Co.	July 10, 1906	Herkimer-Frankfort road, No. 458, Herkimer county	Eastern	38,925 00	31,367 00	14,145 88
The Clinton Beckwith Engineering and Contracting Co.	July 9, 1906	East Schuyler-Deerfield road, No. 459, Herkimer county	Eastern	62,300 00	56,000 00	12,348 80
J. H. Nelson & Co.	July 10, 1906	Herkimer-Middleville road, No. 460, Herkimer county	Eastern	72,515 00	62,325 93	10,595 41
The Clinton Beckwith Engineering and Contracting Co.	Aug. 31, 1906	Ausable Forks-Clintonville road, No. 476, Clinton county	Eastern	56,150 00	44,649 00	25,003 44
Robertson & Gerehart Construction Co.	Sept. 4, 1907	Selkirk-Coeymans road, No. 508, Albany county	Eastern	41,000 00	38,646 16	....
Stewart-Kerbaugh-Shanley Co.	Sept. 4, 1907	Mt. Kisco-Pleasantville road, No. 519, Westchester county	Eastern	42,270 00	39,653 20	....
Stewart-Kerbaugh-Shanley Co.	Sept. 4, 1907	Pleasantville-Pocantico Hills road, No. 520, Westchester county	Eastern	36,250 00	31,822 80	....
Jeremiah T. Finch	Sept. 5, 1907	West Chazy-Chazy road, No. 533, Clinton county	Eastern	56,250 00	52,305 45	....
General Construction Co.	July 7, 1906	Amenia-Wassaic road, No. 537, Dutchess county	Eastern	45,500 00	39,960 00	29,570 40
John W. Polcaro	July 6, 1906	Chatham-Spencertown road, No. 450, Columbia county	Eastern	23,500 00	19,200 00	14,863 73
Jeremiah T. Finch	Sept. 5, 1907	Syosset-Cold Spring Harbor road, No. 545, Nassau county	Eastern	36,850 00	33,678 16	....
James E. Martin	July 5, 1906	Poughkeepsie-Pleasant Valley road, No. 549, Dutchess county	Eastern	60,450 00	52,496 00	32,818 05
Stewart-Kerbaugh-Shanley Co.	Sept. 5, 1907	Rhinebeck-Elizaville road, No. 552, Dutchess county	Eastern	58,500 00	49,595 55	....
The Lane Construction Corporation	Sept. 5, 1907	Matteawan-Wicopee road, No. 567, Dutchess county	Eastern	47,100 00	40,027 00	....
Joseph Walker	July 11, 1906	Baldwin Place-Mahopac road, No. 569, Putnam county	Eastern	51,500 00	44,000 00	33,210 71
Stewart-Kerbaugh-Shanley Co.	Sept. 5, 1907	Carmel-Kent road, No. 570, Putnam county	Eastern	55,650 00	51,925 50	....
Harry S. Williams	Sept. 1, 1906	Nevis-Blue Store road, No. 589, Columbia county	Eastern	28,600 00	24,987 00	10,769 91
County of Rockland	Sept. 13, 1906	Highland Lake-Tompkins Cove road, No. 593, Rockland county	Eastern	105,650 00	105,585 00	29,689 20
Hinman & Sproul	Sept. 5, 1907	New Lebanon-Brainard road, No. 615, Columbia county	Eastern	62,800 00	53,188 15	....
Malloy & Davis	Sept. 5, 1907	Rotterdam Junction-Pattersonville road, No. 640, Schenectady county	Eastern	34,000 00	28,717 50	....
Reardon & Byrne	Sept. 5, 1907	Sandy Hill-Glens Falls road, No. 656, Warren county	Eastern	25,000 00	20,062 01	....
John Weber & Sons, Inc	Dec. 21, 1906	Cortland-Homer road, No. 208, Cortland county	Middle	8,600 00	7,545 00	543 24
Celestin C. Burns	July 7, 1906	Adams-Henderson (section 2) road, No. 234, Jefferson county	Middle	49,950 00	45,176 00	24,422 62
Celestin C. Burns	July 7, 1906	Watertown-Sacketts Harbor-Henderson (section 2) road, No. 235, Jefferson county	Middle	15,180 00	13,962 00	15,411 55
Stewart-Kerbaugh-Shanley Co.	Sept. 20, 1907	Redwood-Alexandria Bay (section 2) road, No. 236, Jefferson county	Middle	38,200 00	35,467 20	....
Celestin C. Burns	July 7, 1906	Henderson Harbor road, No. 238, Jefferson county	Middle	30,450 00	27,858 00	20,070 49
Stewart-Kerbaugh-Shanley Co.	Sept. 20, 1907	Coleman Hill (section 1) road, No. 245, Onondaga county	Middle	15,600 00	14,716 45	....
Casey & Murray	July 10, 1906	Utica-Oneida Castle (section 1) road, No. 250, Oneida county	Middle	144,100 00	133,050 00	122,208 56
County of Broome	July 12, 1906	Deposit road, No. 265, Broome county	Middle	30,000 00	26,474 70	16,917 34
County of Broome	July 12, 1906	Tunnel road, No. 266, Broome county	Middle	13,750 00	13,319 00	4,195 49
County of Broome	July 12, 1906	Castle Creek road, No. 267, Broome county	Middle	54,750 00	54,662 70	42,308 93
Casey & Murray	Sept. 15, 1906	Utica-Oneida Castle (section 2) road, No. 271, Oneida county	Middle	86,500 00	79,800 00	11,673 90
County of Broome	July 12, 1906	Gulf Bridge (section 1) road, No. 274, Broome county	Middle	15,250 00	14,406 28	11,928 40
County of Broome	July 12, 1906	Union-Maine road, No. 275, Broome county	Middle	31,500 00	30,604 00	6,059 59

TABLE OF CONTRACTS PENDING SEPTEMBER 30, 1907 — (Continued).

Improvement of Public Highways — (*Continued*).

Chapter 115, Laws of 1898, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Engineer's preliminary estimate.	Contract price.	Payments to Sept. 30, 1907.
Stewart Kerbaugh-Shanley Co	Sept. 20, 1907	Syracuse-Watertown road, No. 278, Oswego county	Middle	$26,950 00	$23,475 80	....
Stewart-Kerbaugh Shanley Co	Sept. 20, 1907	West Oswego River road, No. 279, Oswego county	Middle	27,800 00	25,423 35	....
The Barnett Contracting Co	Sept. 18, 1906	Oswego-Sterling road, No. 280, Oswego county	Middle	13,550 00	12,700 00	$12,970 80
Wm. J. Dwyer	Aug. 31, 1906	South Salina Street road, No. 290, Onondaga county	Middle	13,900 00	12,200 00	8,564 40
Chas. H. Quereau	July 10, 1906	West Lake (section 2) road, No. 292, Onondaga county	Middle	10,550 00	9,350 00	....
Chas. H. Quereau	July 10, 1906	East Lake (section 2) road, No. 293, Onondaga county	Middle	9,500 00	8,750 00	2,992 50
Casey & Murray	July 10, 1906	Mohawk River road, Floyd, No. 295, Oneida county	Middle	29,750 00	26,750 00	18,812 70
Casey and Murray	July 10, 1906	Mohawk River road, Marcy, No. 296, Oneida county	Middle	49,200 00	43,250 00	43,530 30
H. C. Schroeder	Sept. 18, 1907	Reservation road, Fayette, No. 320, Seneca county	Middle	50,500 00	45,743 15	....
Wm. J. Dwyer	Aug. 31, 1906	Valley road, Marcellus, No. 328, Onondaga county	Middle	19,500 00	17,300 00	778 50
Chas. H. Quereau	Nov. 23, 1906	Valley road, Camillus, No. 329, Onondaga county	Middle	34,400 00	30,250 00	13,884 75
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Skaneateles-Hamilton Turnpike (section 1) road, No. 330, Onondaga county	Middle	28,500 00	27,093 00	....
County of Tompkins	Aug. 30, 1906	Cayuga Heights road, No. 336, Tompkins county	Middle	37,400 00	33,182 00	4,180 93
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1906	Syracuse Turnpike, No. 337, Madison county	Middle	13,800 00	12,525 30	....
County of Tompkins	Aug. 30, 1906	Catskill Turnpike (section 2) road, No. 338, Tompkins county	Middle	14,900 00	13,111 00	4,247 96
Wm. I. Tyler	Sept. 18, 1906	Georgetown road, No. 339, Madison county	Middle	31,400 00	27,487 50	4,452 98
Wm. J. Dwyer	July 9, 1906	Collamer road, No. 348, Onondaga county	Middle	20,400 00	18,000 00	17,834 41
John H. Gordon	Nov. 23, 1906	Augusta road, Augusta, No. 368, Oneida county	Middle	36,000 00	34,500 00	2,794 50
John H. Gordon	Aug. 29, 1906	Augusta road, Oriskany Falls, No. 369, Oneida county	Middle	30,600 00	28,000 00	23,431 75
County of Broome	July 12, 1906	Maine road, No. 374, Broome county	Middle	33,550 00	32,902 60	1,184 49
County of Broome	July 12, 1906	Barker road, No. 375, Broome county	Middle	6,550 00	6,290 50	4,868 85
John Weber and Sons, Inc	July 10, 1906	McGranville road, No. 378, Cortland county	Middle	30,750 00	26,661 00	22,075 31
John Weber and Sons, Inc	Sept. 19, 1906	Harford road, No. 379, Cortland county	Middle	7,600 00	6,868 00	....
Mott and Kemper	Nov. 14, 1906	State road, Homer, No. 380, Cortland county	Middle	42,400 00	37,300 00	7,775 10
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	State road, Scott, No. 381, Cortland county	Middle	27,300 00	26,475 75	....
Brayer Brothers	July 10, 1906	Owasco road, No. 383, Cayuga county	Middle	21,500 00	18,000 00	15,228 00
The Scofield Co	Nov. 10, 1906	Fleming road, No. 384, Cayuga county	Middle	31,960 00	28,250 00	6,610 50
Allyn G. Bridge	Nov. 27, 1906	Augusta road, Vernon Center, No. 406, Oneida county	Middle	38,900 00	34,759 75	26,089 38
County of Broome	July 12, 1906	Vestal road, No. 420, Broome county	Middle	35,600 00	35,287 18	....
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Watertown-Theresa (section 3) road, No. 423, Jefferson county	Middle	40,350 00	37,169 85	....
Frederick Williams	Nov. 16, 1906	Bellville-Adams (section 1) road, No. 424, Jefferson county	Middle	11,900 00	11,000 00	9,603 00
Wm. J. Semper	July 8, 1906	Adams-Watertown (section 2) road, No. 425, Jefferson county	Middle	26,100 00	24,000 00	10,152 00
Wm. J. Dwyer	July 9, 1906	Thompson road, No. 429, Onondaga county	Middle	25,700 00	22,700 00	16,548 30
J. Charles Dayton	July 20, 1906	Skaneateles-Spafford road, No. 431, Onondaga county	Middle	27,700 00	25,997 00	10,996 73
M. F. Dollard	Aug. 29, 1906	Augusta road, (Lowell and Spencer sections), No. 438, Oneida county	Middle	70,500 00	66,666 00	48,180 91

Stewart-Kerbaugh-Shanloy Co.	Sept. 20, 1907	Phoenix-Pennellville road, No. 450, Oswego county	Middle	21,550 00	18,787 50	....
Wm. J. Dwyer	July 9, 1906	Cicero-South Bay road, No. 452, Onondaga county	Middle	33,100 00	28,937 95	....
County of Tompkins	Aug. 30, 1906	Ithaca road, No. 454, Tompkins county	Middle	37,900 00	33,238 75	26,624 24
County of Tompkins	Aug. 30, 1906	Wyckoff road, No. 455, Tompkins county	Middle	4,500 00	3,851 25	....
County of Tompkins	Aug. 30, 1906	Catskill Turnpike (section 3) road, No. 483, Tompkins county	Middle	44,400 00	35,655 25	2,246 28
John Young	Nov. 10, 1906	Skaneateles-West Lake (sections 3, 4 and 5) road, No. 486, Onondaga county	Middle	37,000 00	31,994 00	17,852 65
Daniel V. Brown	Nov. 10, 1906	Elbridge road, No. 487, Onondaga county	Middle	44,300 00	36,487 00	3,612 21
Daniel V. Brown	Nov. 10, 1906	Norwich-North Norwich road, No. 505, Chenango county	Middle	45,848 00	37,769 00	25,591 16
Wm. I. Tyler	July 6, 1906	Chittenango-Eagle Village road, No. 506, Madison county	Middle	21,700 00	19,000 00	15,732 00
Mott & Kemper	July 6, 1906	Oswego-Mexico (section 1) road, No. 509, Oswego county	Middle	50,000 00	44,700 00	39,827 70
John Weber & Sons, Inc	July 10, 1906	Homer-Tully (section 1) road, No. 510, Cortland county	Middle	29,366 00	25,770 00	1,623 51
Stewart-Kerbaugh-Shanley Co.	Sept. 20, 1907	Massena-Waddington (sections 1, 2, 3 and 4) road, No. 521, St. Lawrence county	Middle	61,800 00	59,660 00	....
Stewart-Kerbaugh-Shanley Co.	Sept. 20, 1907	Cortland-Dryden (section 2) road, No. 535, Cortland county	Middle	21,750 00	20,019 60	....
Casey & Murray	Sept. 17, 1907	Utica-Bridgewater road, No. 559, Oneida county	Middle	81,000 00	76,347 00	....
Casey & Murray	Sept. 17, 1907	Mohawk River road, Rome, No. 560, Oneida county	Middle	24,600 00	23,406 70	....
The Scofield Co.	Nov. 10, 1906	Auburn-Seneca Falls (section 1) road, No. 590, Cayugo county	Middle	76,900 00	69,660 00	13,792 68
Jeremiah T. Finch	Nov. 15, 1906	Moravia-Niles road, No. 591, Cayuga county	Middle	89,800 00	82,392 00	22,245 84
Chambers & Grady	Sept. 18, 1906	Auburn-Elbridge road, No. 592, Cayuga county	Middle	55,400 00	47,000 00	24,111 00
Stewart-Kerbaugh-Shanley Co.	Sept. 20, 1907	Norwich-South New Berlin (section 1) road, No. 596, Chenango county	Middle	35,900 00	32,988 50	....
Stewart-Kerbaugh-Shanley Co.	Sept. 20, 1907	Cayuga Heights-Hanshaw's Corners road, No. 606, Tompkins county	Middle	25,000 00	21,511 75	....
Stewart-Kerbaugh-Shanley Co.	Sept. 20, 1907	Auburn-Owasco road, No. 614, Cayuga county	Middle	59,000 00	54,662 15	....
Stewart-Kerbaugh-Shanley Co.	Sept. 20, 1907	Trumansburg-Ithaca road, No. 616, Tompkins county	Middle	94,500 00	88,439 60	....
Frederick A. Brotsch	July 11, 1906	Lyell road, No. 253, Monroe county	Western	22,000 00	18,000 00	16,660 35
Frederick A. Brotsch	July 11, 1906	Chili (section 1) road, No. 254, Monroe county	Western	27,700 00	19,400 00	....
Frederick A. Brotsch	July 11, 1906	Chili (section 2) road, No. 255, Monroe county	Western	26,000 00	16,070 00	....
Greece Construction Co.	July 13, 1906	Little Ridge (section 3) road, No. 256, Monroe county	Western	28,800 00	23,600 00	18,603 00
Gantz-Wilson Construction Co.	July 18, 1906	Aurora-Buffalo (section 2) road, No. 263, Erie county	Western	37,121 35	39,950 00	19,505 70
Erie County Board of Supervisors	July 10, 1906	Aurora-Buffalo (section 3) road, No. 264, Erie county	Western	6,900 00	6,500 00	4,838 40
Frederick A. Brotsch	July 11, 1906	Hilton road, No. 269, Monroe county	Western	28,000 00	26,000 00	22,505 13
Stewart-Kerbaugh-Shanley Co.	Sept. 20, 1907	Left Fork-German Church-Redman road, No. 286, Monroe county	Western	40,300 00	36,392 40	....
Monroe Roads Co.	Sept. 17, 1907	Clover street (section 1) road, No. 294, Monroe county	Western	44,900 00	40,475 34	1,154 70
Bovier & Rawlins	July 7, 1906	Erin-Horseheads road, No. 356, Chemung county	Western	102,000 00	93,012 00	93,807 99
Gantz-Wilson Construction Co.	July 18, 1906	Clinton street road, No. 371, Erie county	Western	49,048 20	45,925 00	83,187 40
Gantz-Wilson Construction Co.	July 18, 1906	Clinton street (section 2) road, No. 372, Erie county	Western	54,146 20	52,995 00	5,723 46
Wm. E. Baldwin & Co.	July 9, 1906	Goodrich road, No. 373, Erie county	Western	84,400 00	69,197 00	17,201 69
Thomas Hucknell	Aug. 31, 1906	Five Corners-Kuckville (section 1) road, No. 386, Orleans county	Western	21,300 00	17,531 00	20,159 91
Thomas Hucknell	Aug. 31, 1906	Five Corners-Kuckville (section 2) road, No. 387, Orleans county	Western	41,500 00	36,935 00	4,653 81
Chambers & Grady	July 9, 1906	Kendall Corners road, No. 388, Orleans county	Western	24,900 00	22,700 00	7,559 10
F. W. Knickenberg	Sept. 27, 1907	Maple Ridge (section 1) road, No. 389, Orleans county	Western	21,600 00	17,924 10	....
F. W. Knickenberg	Sept. 27, 1907	Maple Ridge (section 2) road, No. 390, Orleans county	Western	19,000 00	16,636 25	....

TABLE OF CONTRACTS PENDING SEPTEMBER 30, 1907 —(Concluded).

Improvement of Public Highways—(*Concluded*).

Chapter 115, Laws of 1898, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Engineer's preliminary estimate.	Contract price.	Payments to Sept. 30, 1907.
Jeremiah T. Finch	Sept. 19, 1907	Latta road, No. 399, Monroe county	Western	$82,000 00	$72,004 95	
Henry C. Schroeder	Sept. 24, 1907	Portland avenue (section 2) road, No. 400, Monroe county	Western	7,800 00	6,684 78	
Good Roads Construction Co	Sept. 8, 1906	Suspension Bridge-Lewiston road, No. 475, Niagara county	Western	25,500 00	23,500 00	$28,848 45
Wm. E. Baldwin & Co	July 9, 1906	Transit (section 3) road, No. 507, Niagara county	Western	48,000 00	38,699 00	30,648 86
Wm. E. Baldwin & Co	July 9, 1906	Hamburg-North Collins road, No. 523, Erie county	Western	114,900 00	94,000 00	3,449 07
Mosier & Summers	Sept. 17, 1907	North Collins-Lawton road, No. 524, Erie county	Western	73,900 00	64,585 85	
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Lawton-Gowanda road, No. 525, Erie county	Western	46,900 00	44,446 80	
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Collins-Mortons Corners (section 1) road, No. 526, Erie county	Western	37,300 00	36,454 25	
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Hamburg-Springville (section 1) road, No. 527, Erie county	Western	87,500 00	72,915 00	
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Hamburg-Springville (section 2) road, No. 528, Erie county	Western	66,500 00	61,257 75	
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Alden-Town Line and Clinton street-Marilla road, No. 529, Erie county	Western	49,000 00	45,596 90	
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Base Line-Grand Island road, No. 530, Erie county	Western	14,000 00	13,696 75	
F. W. Knickenberg	June 30, 1906	East Pembroke-Batavia road, No. 586, Genesee county	Western	49,000 00	37,960 00	18,717 84
Gantz-Wilson Construction Co	Sept. 24, 1907	Olean-Allegany (section 2) road, No. 601, Cattaraugus county	Western	39,000 00	35,963 19	
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Lewiston-Dickersonville road, No. 617, Niagara county	Western	35,000 00	32,330 00	
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Mt. Morris-Geneseo road, No. 622, Livingston county	Western	49,200 00	46,197 30	

Maintenance and Repairs of Improved Public Highways.

Chapter 468, Laws of 1906; Chapter 686, Laws of 1906.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Contract price.	Payments to Sept. 30, 1907.
County of Broome..........	July 26, 1906	Contract No. 6—Roads Nos. 125 and 127, Broome county......	Middle...	$4,794 50	$3,744 72
Joseph H. Conners..........	July 17, 1907	Contract No. 22—Roads Nos. 3 and 71, Oneida county.........	Middle...	8,162 50	689 17
Joseph H. Conners..........	July 17, 1907	Contract No. 23—Road No. 147, Jefferson county..............	Middle...	3,637 50	2,648 25
Douglas V. Ashley..........	July 19, 1907	Contract No. 24—Road No. 224, Chenango county..............	Middle...	6,932 50	4,398 30
Joseph H. Conners..........	July 17, 1907	Contract No. 25—Roads Nos. 49 and 121, Onondaga county....	Middle...	10,825 00	6,693 66
Pittsford Construction Co...	Aug. 14, 1906	East avenue road, No. 5, Monroe county......................	Western..	11,817 00	1,007 25
Pittsford Construction Co...	Aug. 14, 1906	Fairport road, No. 60, Monroe county........................	Western..	1,440 00	1,149 00
Pittsford Construction Co...	Aug. 14, 1906	Pittsford road, No. 61, Monroe county.......................	Western..	285 00	136 80
Pittsford Construction Co...	Aug. 14, 1906	Monroe avenue road, No. 94, Monroe county..................	Western..	2,249 00	2,058 60
Pittsford Construction Co...	Aug. 14, 1906	Penfield (section 1) road, No. 166a, Monroe county............	Western..	148 25	....
Pittsford Construction Co...	Aug. 14, 1906	Penfield (section 2) road, No. 167a, Monroe county............	Western..	972 55	504 75
Grand Avenue Horse Co....	Aug. 9, 1906	Dugway (section 1) road, No. 168, Monroe county.............	Western..	9,569 00	4,976 90
Pittsford Construction Co...	Aug. 14, 1906	Dugway (section 2) road, No. 169a, Monroe county............	Western..	594 50	....
Grand Avenue Horse Co....	Aug. 9, 1906	Dugway (section 3), road, No. 170, Monroe county............	Western..	466 00	....
John Johnson..............	Sept. 19, 1906	Bristol Valley (section 1) road, No. 188a, Ontario county.......	Western..	153 00	....
John Johnson..............	Sept. 19, 1906	East Side Lake (section 1) road, No. 190a, Ontario county......	Western..	500 00	....
John Johnson..............	Sept. 19, 1906	Gorham-Stanley road, No. 203a, Ontario county..............	Western..	804 50	....

ROADS FOR WHICH CONTRACTS HAVE BEEN AWARDED UNDER CHAPTER 115, LAWS OF 1898, AND CHAPTER 468, LAWS OF 1906, TO OCTOBER 1, 1907.

EXPLANATORY NOTES.—"Same" means that the filler was screened from the crushed stone forming the course. Bl means bluestone, which is a tough sandstone. Li means limestone; gran means granite or granitic; quart, quartzite; san, sandstone; fld, fieldstone; gr, gravel; lo, local; qua, quarried; ro, rock; br, broken; st, stone; sam, same; sh, shale.

Road number.	NAME OF ROAD.	County.	Date of contract.	Length in miles.	Width of macadam.	Width of roadway.	Cubic yards excavation per mile.	MATERIALS.				Per cent. completed.	TOTAL COST COMPLETED.	
								BOTTOM. (Usually 4 inches thick after rolling.)		TOP. (Usually 2 inches thick after rolling.)			Whole.	Per mile.
								Kind of crushed rock.	Kind of screenings or sand as filler.	Kind of crushed rock.	Kind of screenings or sand as filler.			
					Feet.	Feet.								
1	Troy and Schenectady	Schen'ct'dy	9, 7, '98	2.00	16	22	5,500	Limestone	Same	Trap-rock	Limestone	100	$16,517 51	$8,259
2	White's Corners-Hamburg	Erie	10, 4, '98	6.540	12	22	4,590	Limestone	Same	Limestone	Limestone	100	30,928 60	4,729
2a	White's Corners	Erie	8, 9, '00	6.540	20, 13	22	......	......	......	Trap-rock	Limestone	100	24,294 57	3,715
3	Deerfield	Oneida	10, 4, '98	2.25	12	18	5,000	Limestone	Same	Trap-rock	Limestone	100	16,338 24	7,261
4	New Lebanon-Pittsfield	Columbia	10, 25, '98	1.23	16	21	13,000	Gravel	None	Gravel	None	100	9,992 87	8,124
5	East Avenue	Monroe	3, 6, '99	2.45	12	22	8,160	Limestone	Same	Trap-rock	Limestone	100	13,898 70	5,673
6	Little Ridge, Sec. 1	Monroe	8, 16, '99	6.53	16	26	2,150	Lo fld san	Le Roy li	Trap-rock	T'k's C'v. li	100	40,013 89	6,128
7	Delaware Turnpike, Sec. 1	Albany	5, 12, '00	1.04	15	22	16,827	Limestone	Same	Trap-rock	Limestone	100	23,672 80	......
7a	Delaware Turnpike, Sec. 1	Albany	3, 27, '03	1.04	15	22	......	......	......	Limestone	Same	100	7,881 53	7,578
7b	Delaware Turnpike, Sec. 1	Albany	4, 7, '03	1.04	15	22	......	......	......	Limestone	Same	......	......	......
8	Cortland Street	On'daga.	7, 6, '99 9, 21, '99	1.20	15	22	2,500	Li 6"	Same	Trap-rock	Limestone	100	12,889 56	10,741
9	James Street	On'daga.	9, 21, '99 7, 1, '99	0.58	15	22	3,300	Li 6"	Same	Trap-rock	Limestone	100	7,729 93	13,327
10	Troy and Brunswick, Sec. 1	Rensselaer	7, 21, '99	1.00	15	22, 25	4,300	Limestone	Same	Trap-rock	Limestone	100	7,437 26	7,437
11	Troy and Greenbush, Sec. 1	Rensselaer	7, 21, '99	1.03	15	22	8,738	Limestone	Same	Trap-rock	Cl't'n Pt. li	100	10,642 75	10,333
12	......	......	......	......	......	......	......	......	......	......	......	......	......	......
13	Southport, Sec. 1	Chemung	5, 16, '00	2.60	16	20	3,170	Lo qua san	Same	Trap-rock	Le Roy li	100	20,903 04	8,040
14	Frankfort and Utica	Herkimer	5, 8, '00	1.11	15	22	5,712	Gneiss	Limestone	Gneiss	Limestone	......	......	......
15	Hudson Avenue, Sec. 1	Monroe	5, 8, '00	0.637	16	22	7,100	Limestone	T'k's C'v. li	Trap-rock	T'k's C'v. li	100	7,242 67	11,370
16	Ulster and Delaware, Sec. 1	Ulster	5, 14, '00	5.66	12	16	2,915	Lo "bl"	Same	Local "bl"	Same	100	30,040 00	5,307
17	Hastings-Ardsley	Westchest.	5, 12, '00	0.60	16	22	4,750	Lo gran ro	T'k's C'v. li	Trap-rock	T'k's C'v. li	100	6,192 33	10,321
18	Ardsley-Elmsford	Westchest.	5, 12, '00	3.06	16	22	3,791	Lo gran ro	T'k's C'v. li	Trap-rock	T'k's C'v. li	100	27,392 18	8,952
19	Mamaroneck-White Plains	Westchest.	7, 23, '00	2.80	16	22	5,786	Lo gran ro	Limestone	Trap-rock	Limestone	100	28,014 56	10,005
20	White Plains-Armonk	Westchest.	5, 12, '00	3.77	14	20	4,509	Lo gran ro	Limestone	Trap-rock	Limestone	100	31,520 00	8,361
21	Sauquoit Creek	Oneida	7, 6, '00	1.33	15	22	2,077	Limestone	Same	Trap-rock	Limestone	100	10,487 32	7,885
22	Loudon (N. from Albany)	Albany	6, 25, '00	3.41	16	22	2,933	Limestone	Cl't'n Pt. li	Trap-rock	Cl't'n Pt. li	100	35,507 96	10,413

23	River (N. from Buffalo)........	Erie......	7, 26, '00	1.458	20	26	5,750	Limestone...	Flint & li....	Trap-rock...	Flint & li....	100	17,356 04	11,904
24	....	....	....	....	....	....	....	....	....	....	....	....	....	....
25	Troy and Brunswick, Sec. 2....	Rensselaer	7, 16, '01	3.05	15	22, 25	2,459	Lo quart...	Sandy loam and same..	Lo quart	Sandy loam and same..	100	28,820 00	9,449
26	Troy and Greenbush, Sec. 2....	Rensselaer	6, 29, '01	2.59	16	22	5,405	Limestone...	Cl't'n Pt. li..	Trap-rock...	Sam & CPli..	100	22,658 49	8,748
27	Orchard Park, Sec. 1..........	Erie......	9, 27, '00	1.155	16	20	3,430	Limestone...	Same.......	Trap-rock...	Limestone...	100	14,619 30	12,657
28	Southport, Sec. 2.............	Chemung..	7, 17, '01	3.408	16	20	5,780	Lo qua san...	Same.......	Trap-rock...	Le Roy li....	100	36,482 25	10,704
29	Southport, Sec. 3.............	Chemung..	7, 17, '01	1.06	16	20	1,670	Lo qua san...	Same.......	Trap-rock...	Le Roy li....	100	11,987 82	11,309
30	South Broadway.............	Chemung..	7, 17, '01	1.021	16	20	1,600	Lo qua san...	Same.......	Trap-rock...	Le Roy li....	100	10,799 39	10,577
31	Ulster and Delaware, Sec. 3....	Ulster.....	6, 10, '01	5.72	12, 16	16, 22	3,234	Lo "bl".....	Same.......	Lo "bl".....	Same.......	100	41,728 00	7,295
32	Amsterdam–Minaville..........	Montg'm'y	6, 5, '01	2.65	12	22	5,660	Fieldstone...	Same.......	N ½, li..... S ½, fld....	Limestone. Limestone.	100	17,510 00	6,608
33	Gloversville–Mayfield..........	Fulton....	6, 5, '01	4.04	16	22	4,827	Lo gran ro...	½ same, ½ li..	Lo gran ro...	½ sam, ½ li...	100	30,952 00	14,330
34	Ardsley–Elmsford, Sec. 2.......	Westchest.	5, 31, '01	2.16	16	22	6,667	Lo gran ro...	Same.......	Trap-rock...	Limestone...	100	20,954 20	9,701
35	White Plains–Armonk, Sec. 2...	Westchest.	7, 22, '01	3.21	14	20	3,302	Lo gran ro...	Same.......	Lo gran ro...	Same & li...	100	26,000 00	8,100
36	Griffin's Corners..............	Delaware..	6, 18, '01	1.57	12	16	5,238	Lo "bl'.....	Same.......	Lo "bl".....	Same.......	100	13,116 55	8,354
37	Saugerties–Woodstock, Sec. 1...	Ulster.....	6, 10, '01	4.00	12	16 18 20 22	3,125	Lo "bl".....	Same.......	Lo "bl".....	Same.......	100	22,881 18	5,720
38	Saugerties–Woodstock, Sec. 2...	Ulster.....	5, 6, '02	4.90	12	16–24	3,367	Lo "bl".....	Sand.......	Lo "bl".....	Same.......	100	35,520 00	7,249
39	Waterford–Mech'ville, Sec. 1....	Saratoga...	7, 27, '01	1.51	16	22	2,119	Limestone...	Same.......	Trap-rock...	Limestone...	100	12,370 00	8,192
40	Cuyler (at Truxton)..........	Cortland...	7, 16, '01	0.47	16	26	2,340	Limestone...	Same.......	Limestone...	Same.......	100	3,420 00	7,277
41	Delaware Turnpike, Sec. 2......	Albany....	6, 5, '01	2.74	15	22	5,109	Limestone...	Same.......	Limestone...	Same.......	100	22,497 20	8,211
42	Newburgh–Woodbury.........	Orange....	6, 18, '01	11.00	....	16, 22	Emb. 3,455	Gravel......	None.......	Gravel......	None.......	100	22,330 00	2,030
3	Cochecton Turnpike...........	Orange....	6, 18, '01	7.55	....	22	4,848	Local shale..	None.......	Local shale..	None.......	100	22,928 00	3,037
44	Goshen–Florida..............	Orange....	6, 18, '01	4.22	....	22	Emb. 4,502	Gravel......	None.......	Gravel......	None.......	100	9,690 00	2,296
45	Middletown–Pine Bush........	Orange....	6, 18, '01	9.25	....	16	2,811	Gravel......	None.......	Gravel......	None.......	100	13,770 00	1,489
46	Turners–Monroe.............	Orange....	6, 18, '01	1.59	....	22	3,333	Gravel......	None.......	Gravel......	None.......	100	8,315 02	5,230
47	Chenango River..............	Broome...	8, 12, '01	1.75	16	22	4,160	Fieldstone...	Same.......	Limestone...	Same.......	100	15,980 00	9,131
48	West Lake Road.............	Onondaga.	11, 29, '01	1.00	16	24	5,000	Fieldstone...	Sand.......	Limestone...	Same.......	100	9,100 00	9,100
49	Fabius–Apulia, Sec. 1.........	Onondaga.	5, 17, '02	2.00	16	22	2,309	Fld and li....	Sand.......	Limestone...	Same.......	100	18,600 00	9,300
50	Armonk–Mt. Kisco............	Westchest.	7, 22, '01	4.44	12	20	5,315	Lo gran ro...	Same.......	Lo gran ro...	Same & li...	100	38,103 08	8,582
51	Mt. Kisco–Bedford	Westchest.	7, 24, '01	5.04	12	20	5,615	Lo gran ro...	Sand.......	Lo gran ro...	Same.......	100	44,084 00	8,746
52	Unionville–McKeels Corners....	Westchest.	5, 31, '01	3.69	12	20	5,095	Lo gran ro...	Sand.......	Lo gran ro...	Same.......	100	31,411 00	8,512
53	McKeels Corners–Briar Cliff....	Westchest.	5, 31, '01	1.76	12	20	5,284	Lo gran ro...	Sand.......	Lo gran ro...	Same.......	100	13,967 96	7,936
54	Briar Cliff–Echo Lake.........	Westchest.	7, 17, '01	2.65	12	20	6,792	Lo gran ro...	Same.......	Lo gran ro...	Li & same...	100	22,540 00	8,505
55	Hoag's Corners..............	Rensselaer	7, 16, '01	3.15	....	16	5,238	Earth.......	None.......	Earth & gr..	None.......	100	10,684 00	3,392
56	Plattsburg–Keeseville, Sec. 1...	Clinton....	6, 7, '01	2.82	16	22	3,121	Limestone...	Same.......	Limestone...	Same.......	100	18,910 00	6,706
57	Windsor, Sec. 1..............	Clinton....	6, 7, '01	1,00	16	22	2,800	Limestone...	Same.......	Limestone...	Same.......	100	7,780 00	7,780
58	Glens Falls Saratoga..........	Saratoga...	6, 4, '01	6.06	12	16, 22	3,845	Lo gran ro...	Same.......	Lo gran ro...	Same & sand.	100	34,610 00	5,711
59	Waterford-Mech'ville, Sec. 2....	Saratoga...	7, 27, '01	5.03	16	22, 28	2,425	Limestone...	Same.......	Trap-rock...	Limestone...	100	40,532 00	8,058
60	Fairport....................	Monroe....	7, 15, '01	3.039	16	20, 22	6,580	Limestone...	Same.......	Trap-rock...	Limestone...	100	35,376 84	11,640
61	Pittsford...................	Monroe....	7, 15, '01	1.304	16	22	5,840	Limestone...	Same.......	Trap-rock...	Limestone...	100	14,852 47	11,389
62	West Henrietta..............	Monroe....	6, 28, '02	6.237	16	22	3,447	Limestone...	Sand.......	Limestone...	Same.......	100	55,000 00	8,818
63	Scottsville, Sec. 1............	Monroe....	7, 2, '02	2.254	16	22	2,040	Limestone...	Sand.......	Limestone...	Same.......	100	19,700 00	8,740

Note.—Numbers 12 and 24 were canceled.

ROADS FOR WHICH CONTRACTS HAVE BEEN AWARDED UNDER CHAPTER 115, LAWS OF 1898, AND CHAPTER 468, LAWS OF 1906, TO OCTOBER 1, 1907 — (Continued).

Road number.	NAME OF ROAD.	County.	Date of contract.	Length in miles.	Width of macadam.	Width of roadway.	Cubic yards excavation per mile.	MATERIALS.				Per cent completed.	TOTAL COST COMPLETED.	
								BOTTOM. (Usually 4 inches thick after rolling.)		TOP. (Usually 2 inches thick after rolling.)				
								Kind of crushed rock.	Kind of screenings or sand as filler.	Kind of crushed rock.	Kind of screenings or sand as filler.		Whole.	Per mile.
					Feet.	Feet.								
64	Walden Scott's Corners	Orange	6, 20, '02	1.840	....	16	2,554	Gravel	None	Gravel	None	100	$4,868 00	$2,646
65	Montgomery-Goshen	Orange	6, 20, '02	7.950	....	22	4,302	Gr & br st	Same	Gr & br st	Same	100	35,712 20	4,492
66	Orchard Park, Sec. 2	Erie	6, 11, '02	0.952	16	20	5,013	Limestone	Same	Limestone	Same	100	11,600 00	12,185
67	Orchard Park, Sec. 3	Erie	6, 11, '02	3.410	16	20	4,200	Limestone	Same	Limestone	Same	100	34,900 00	10,234
68	Orchard Park, Sec. 4	Erie	6, 11, '02	1.170	16	20	3,513	Limestone	Same	Limestone	Same	100	12,728 00	10,879
69	Main Street, Sec. 1	Erie	5, 9, '02	3.415	16	22	1,252	Limestone	Same	Limestone	Same	100	28,000 00	8,167
70	....	....	....	....	....	....	....	....	....	....	....	....	....	....
71	Utica-Paris	Oneida	5, 6, '02	5.200	16	24	4,231	Limestone	Same	Trap-rock	Limestone	100	47,200 00	9,077
72	Catskill Turnpike, Sec. 1	Tompkins	6, 9, '03	1.869	16	28	3,210	Fieldstone	Sand & same	Limestone	Same	100	18,000 00	9,631
73	Quaker Street, Sec. 1	Schen'ct'dy	5, 17, '02	1.180	12-16	18-22	13,982	Limestone	Same	Limestone	Same	100	15,993 00	13,553
74	Marcellus	Onondaga	6, 18, '02	1.000	12	18-22	6,918	Limestone	Sand & same	Limestone	Same	100	11,047 64	11,048
75	Fabius-Apulia, Sec. 2	Onondaga	5, 17, '02	0.864	16	22	3,939	Limestone	Sand	Limestone	Same	100	9,150 00	10,590
76	La Fayette	Onondaga	5, 17, '02	1.000	16	24	3,855	Fieldstone	Sand	Limestone	Same	100	7,982 35	7,982
77	Albia-Wyantskill	Rensselaer	5, 6, '02	1.500	16	22	2,330	Local fld	Sand	Local fld	Same	100	12,180 00	8,120
78	Clifton, Sec. 1	Monroe	7, 2, '02	3.623	16	22	2,445	Limestone	Sand	Limestone	Same	100	30,996 20	8,555
79	Scottsville, Sec. 2	Monroe	6, 28, '02	7.588	16	22	2,096	Limestone	Sand	Limestone	Same	100	61,593 00	8,117
80	Hamlin, Sec. 1	Monroe	5, 20, '02	4.637	16	22	1,470	San b'ld'rs	Sand	Gran b'ld'rs	Same	100	39,000 00	8,410
81	Hamlin, Sec. 2	Monroe	5, 20, '02	4.057	16	22	1,470	San b'ld'rs	Sand	Gran b'ld'rs	Same	100	33,500 00	8,257
82	Buffalo, Sec. 1	Monroe	5, 20, '02	0.364	16	25	1,780	Limestone	Sand	Limestone	Same	100	3,280 00	9,011
83	Buffalo, Sec. 2	Monroe	5, 20, '02	5.089	16	22	1,607	Limestone	Sand	Limestone	Same	100	41,617 35	8,178
84	Troy and Brunswick, Sec. 3	Rensselaer	5, 12, '02	2.460	15	22	2,235	Local quart	Sandy loam	Local quart	Same & sand	100	22,259 16	9,048
85	Ft. Edward-Sandy Hill	Wash'ngt'n	5, 12, '02	0.920	18	22	1,521	Local li	Sand	Local li	Same	100	10,265 19	11,158
86	Big Tree	Erie	6, 11, '02	4.004	16	22	4,461	Lo b'ld'rs	Limestone	Gran b'ld'rs	Limestone	100	42,500 00	10,614
87	Main Street, Sec. 2	Erie	5, 9, '02	1.926	16	22	986	Limestone	Same	Limestone	Same	100	17,000 00	8,826
88	Transit, Sec. 1	Erie	5, 9, '02	4.283	16	22	1,909	Limestone	Same	Limestone	Same	100	39,205 80	9,154
89	Transit, Sec. 2	Erie	5, 9, '02	4.063	16	22	2,230	Limestone	Same	Limestone	Same	100	41,422 00	10,121
90	Grassy Point	Rockland	5, 12, '02	2.830	16	22	3,180	Local li	Same	Trap-rock	Limestone	100	23,692 00	8,372
91	Nyack Turnpike	Rockland	5, 20, '02	3.900	16	22	2,179	Lo gran ro	Sand	Lo gran ro	Same	100	29,830 06	7,649
92	Delmar-Slingerlands	Albany	5, 12, '02	1.740	16	22	3,793	Limestone	Li & sand	Limestone	Limestone	100	17,630 00	10,132
93	Florida-Warwick	Orange	6, 20, '02	4.670	....	22	5,139	Gr, sh, br st	Same	Gr, sh, br st	Same	100	27,885 00	5,873
94	Monroe Avenue	Monroe	6, 9, '02	4.226	14-16	22, 24	1,850	Limestone	Same	Limestone	Same	100	35,400 00	8,376

95	Middletown-Goshen	Orange	6, 20, '02	5.860	....	22	5,358	Gr, br, st	Same	Gr, br, st	Same	100	34,230 50	5,842
96	Amsterdam-Minaville, Sec. 2	Montg'm'y	5, 17, '02	0.644	12-14	22	8,540	Local fld	Sand	Local fld	Same	100	6,430 00	9,984
97	Shunpike Road	Wash'ngt'n	5, 12, '02	3.610	12	22	4,155	Local quart	Sand	Local quart	Sand & same	100	26,735 60	7,406
98	Webster, Sec. 1	Monroe	5, 20, '02	1.576	14-16	20, 22	4,700	Limestone	Same	Limestone	Same	100	19,600 00	12,437
99	Webster, Sec. 2	Monroe	6, 3, '02	2.960	14-16	20 21 22	2,000	Limestone	Same	Limestone	Same	100	32,800 00	11,081
100	Webster, Sec. 3	Monroe	7, 1, '02	3.398	16	22	1,324	San b'ld'rs	Sand	Gran b'ld'rs	Same	100	29,166 00	8,583
101	Webster, Sec. 4	Monroe	7, 1, '02	2.879	16	22	2,018	San b'ld'rs	Sand	Gran b'ld'rs	Same	100	23,374 70	8,119
102	Barracks	Rensselaer	5, 26, '02	2.050	8-12	16-22	6,390	Trap-rock	Sand	Trap-rock	Same	100	24,015 00	11,714
103	Granville-Middle Granville	Wash'ngt'n	5, 7, '02	1.310	16	22	2,061	Local quart	Same	Local quart	Sand & same	100	10,143 00	7,742
104	Granville and Troy Stage	Wash'ngt'n	5, 12 '02	1.250	16	22	3,088	Limestone	Sand	Limestone	Same	100	10,850 00	8,680
105	Quaker Street, Sec. 2	Schen'ct'dy	5, 17, '02	0.349	14-16	18-22	2,636	Limestone	Same	Limestone	Same	100	2,460 00	7,048
106	Quaker Street, Sec. 3	Schen'ct'dy	5, 17, '02	0.132	14-16	18-22	1,742	Limestone	Same	Limestone	Same	100	1,255 00	9,280
107	Fultonville-Glen	Montg'm'y	5, 12, '02	3.660	14-16	17-20-22	6,421	Li & lo fld	Sand	Li & lo fld	Same	100	36,545 00	9,985
108	West Mohawk River	Montg'm'y	5, 12, '02	3.250	14-16	20-22	3,938	Limestone	Sand	Trap-rock	Limestone	100	30,788 00	9,473
109	Argersinger	Fulton	5, 20, '02	2.300	14	20	2,478	Local fld	Same	Local fld	Same	100	17,681 54	7,688
110	Briggs	Fulton	5, 20, '02	2.250	14	20	2,578	Local fld	Same	Local fld	Same	100	17,316 50	7,696
111	Blodgetts Mills	Cortland	5, 23, '02	0.750	12	20	4,400	Lo qua san	Same	Trap-rock	Limestone	100	6,100 00	8,133
112	Norwich-Plymouth	Chenango	5, 20, '02	4.842	12	20	3,926	Lo qua san	Same	Trap-rock	Limestone	100	40,900 00	8,447
113	Cochecton, Sec. 1	Orange	6, 20, '02	2.290	....	22	7,511	Local li	Same	Local li	Same	100	23,693 14	10,346
114	Middletown-Pine Bush, Sec. 2	Orange	6, 20, '02	1.210	....	16	3,140	Local shale	None	Local shale	None	100	4,106 80	3,311
115	Central Valley-Turner, Sec. 1	Orange	6, 20, '02	2.620	....	20	6,870	Gravel	None	Gravel	None	100	31,117 00	11,877
116a	Kingston-Rifton	Ulster	5, 19, '02	4.180	14	18-20	3,792	Lo san, trap	Sand	Lo san, trap	Limestone	100	40,059 59	9,583
116b	Kingston-Rifton	Ulster	5, 19, '02	0.89	14	18-20	2,247	Trap-rock	Sand	Trap-rock	Limestone	100	7,863 00	8,834
117	Ulster-Delaware, Sec. 2	Ulster	5, 15, '02	5.090	12-14	20-22	4,420	Lo "bl"	Same	Lo "bl"	Same	100	55,100 00	10,325
118	Shandaken-Hurley, Sec. 1	Ulster	5, 20, '02	4.000	14	20	2,300	Lo "bl"	Sand	Lo "bl"	Same	100	34,757 00	8,689
119	Loudon, Sec. 2	Albany	7, 25, '02	3.920	16	22	2,321	Lo san	Sand	Lo san	Same	100	37,500 00	9,566
120	Canajoharie-Sharon Springs	Montg'm'y	5, 22, '02	4.140	14	20	2,777	Lo fld	Sand	Lo fld	Same	100	36,546 70	8,828
121	Fabius-Aquila, Sec. 3	Onondaga	5, 17, '02	1.160	16	22	2,099	Limestone	Sand	Limestone	Same	100	9,950 00	8,577
122	East Lake	Onondaga	6, 18, '02	1.000	16	24	2,881	Limestone	Sand & same	Limestone	Same	100	9,500 00	9,500
123	Preble-Homer	Cortland	5, 29, '02	1.230	12	20	2,407	Fieldstone	Same	Li, quart, fld	Same	100	8,692 17	7,067
124	North	Albany	5, 12, '02	1.840	14	20	3,206	Li & lo fld	Sand	Limestone	Same	100	14,412 06	7,832
125	Lestershire	Broome	7, 2, '02	2.955	16	22	2,902	Fieldstone	Sand & same	Trap-rock	Limestone	100	28,800 00	9,746
126	Town Line Extension	Broome	7, 28, '03	1.970	12, 16	24, 26	Emb. 1,751	Fieldstone	Sand & same	Trap-rock	Trap-rock	100	19,260 80	9,777
127	Park Bridge	Broome	7, 28, '03	2.076	16	26	2,317	Fieldstone	Sand & same	Trap-rock	Trap-rock	100	24,532 71	11,817
128	Aurora-Buffalo, Sec. 1	Erie	7, 6, '03	5.573	16	22	2,055	Limestone	Sand	Li & granite	Limestone	100	53,567 13	9,612
129	River, Secs. 2-3	Erie	6, 22, '03	3.015	16	22	1,459	Limestone	Sand	Trap-rock	Limestone	100	26,013 00	8,627
130	Main Street, Sec. 3	Erie	7, 10, '03	5.625	16	22	1,195	Limestone	Sand	Limestone	Same	100	38,181 08	6,788
131	Main Street, Sec. 4	Erie	7, 10, '03	6.581	16	22	1,302	Limestone	Sand	Limestone	Same	100	50,739 61	7,710
132	Genesee Turnpike	Onondaga	7, 30, '03	1.130	16	26	Emb. 1,403	Limestone	Sand & same	Trap-rock	Limestone	100	9,600 00	8,495
133	Little Falls-Dolgeville	Herkimer	6, 10, '03	2.290	14	20	2,620	Lo gneiss	Sand	Lo gneiss	Same & li	100	19,504 65	8,517
134	Fenton	Broome	7, 29, '03	2.170	12, 16	24, 26	Emb. 1,876	Fieldstone	Sand & same	Trap-rock	Trap-rock	100	21,716 20	10,007
135	Violet Avenue	Dutchess	6, 19, '03	3.290	14	20	3,131	Local fld	Sand	Trap-rock	C'l'n Pt. li	100	31,801 91	9,666

Note.—Number 70 canceled.

ROADS FOR WHICH CONTRACTS HAVE BEEN AWARDED UNDER CHAPTER 115, LAWS OF 1898, AND CHAPTER 468, LAWS OF 1906, TO OCTOBER 1, 1907 — (Continued).

Road number.	NAME OF ROAD.	County.	Date of contract.	Length in miles.	Width of macadam.	Width of roadway.	Cubic yards excavation per mile.	MATERIALS.				Per cent completed.	TOTAL COST COMPLETED.	
								BOTTOM. (Usually 4 inches thick after rolling.)		TOP. (Usually 2 inches thick after rolling.)				
								Kind of crushed rock.	Kind of screenings or sand as filler.	Kind of crushed rock.	Kind of screenings or sand as filler.		Whole.	Per mile.
					Feet.	Feet.								
136	Windsor, Sec. 2	Clinton	6 ,23, '03	1.750	16	22	Emb. 1,886	Local li	Same	Local li	Same	100	$14,013 00	$8,008
137	Plattsburgh-Keeseville, Sec. 2	Clinton	6, 16, '03	4.520	16	22	Emb. 2,434	Local san	Sand	Local san	Same	100	36,010 36	7,967
138	Plattsburg-Mooers, Sec. 1	Clinton	6, 16, '03	7.570	14-16	20-22	3,157	Local san	Same	Lo san & li	Same	100	64,786 89	8,558
138a	Plattsburg-Mooers, Sec. 1	Clinton	1, 3, '05	7.570	14-16	20-22				Limestone	Same	100	8,150 18	1,076
139	Hamilton Bridge	Oneida	6, 24, '03	1.290	12,16	24, 26	2,884	Fieldstone	Sa'dy l'm & same	Limestone	Same	100	10,499 39	8,139
140	Seneca Turnpike	Oneida	10, 9, '03	2.280	12, 16	24, 26	2,135	Limestone	Sand & same	Limestone	Sand & same	100	15,600 00	6,845
141	Kingston-Ellenville, Sec. 3	Ulster	6, 16, '03	6.820	12-14	20	Emb. 4,780	Lo. "bl" & li	Sand	Lo "bl" & li	Same	100	63,876 96	9,358
142	Saugerties-Woodstock, Sec. 3	Ulster	6, 16, '03	2.850	14	22	5,263	Local "bl"	Sand	Trap-rock	Bluestone	100	39,317 12	13,795
143	Echo Lake-Pines Bridge	Westchest	6, 15, '03	3.140	12	20	6,051	Lo gran ro	Same	Lo gran ro	Same	100	30,430 00	9,691
144	Bedford-Cross River	Westchest	6, 19, '03	5.300	12-14	20	5,094	Lo gran ro	Sand	Lo gran ro	Same	100	47,333 07	8,931
145	Delaware River	Delaware	7, 28, '03	1.000	16	22-26	6,545	Gravel	None	Gravel	None	100	6,240 00	6,240
146	Geneva-Canandaigua, Sec. 1	Ontario	6, 15, '03	5.624	14	22	1,547	Le Roy li	Sand	Le Roy li	Same	100	40,625 79	7,229
147	Burr's Mills	Jefferson	8, 7, '03	3.920	12, 44	14, 24	3,724	Limestone	Sand & same	Limestone	Same	100	26,700 00	6,811
148	Pines Bridge-Yorkt'n Heights	Westchest	6, 16, '03	3.490	12	20	5,014	Lo gran ro	Same	Lo gran ro	Same	100	33,543 41	9,611
148a	Pine Bridge-Yorkt'n Heights	Westchest	10, 5, '05	3.490								100	635 00	182
149	Yorkt'n Heights-Putnam Co	Westchest	6, 16, '03	6.620	12	20	3,353	Local fld	Sand	Local fld	Same	100	51,232 71	7,739
150	Cross River-Turk Hill	Westchest	6, 19, '03	3.270	12-14	20	6,575	Lo gran ro	Sand	Lo gran ro	Same	100	31,717 17	9,700
151	Turk Hill-Putnam Co. Line	Westchest	6, 19, '03	5.990	12	20	6,102	Lo gran ro	Sand	Lo gran ro	Same	100	62,104 62	10,368
152	Fonda "East"	Montg'm'y	6, 20, '03	2.500	16	22	2,560	Local fld	Sand	Local fld	Same	100	19,333 00	7,733
152a	Fonda "East"	Montg'm'y	11, 7, '06	2.500								100	3,267 00	1,307
153	Newburgh-Campbell Hall	Orange	6, 24, '03	13.380	12	20	4,484	Local fld	Same	Local fld	Same	100	86,816 67	6,488
154	Chester-Vails Gate	Orange	6, 24, '03	11.490	12	20	4,917	Gravel	None	Gravel	None	100	51,837 20	4,511
154a	Chester-Vails Gate	Orange	7, 20, '06	11.490	12							92		
155	Fonda "West"	Montg	6, 20, '03	2.500	16	22	4,800	Local fld	Sand	Local fld	Same	100	24,016 77	9,606
156	Chester-Goshen	Orange	7, 12, '04	3.10		22	Emb. 10,097	Gravel	None	Gravel	None	100	25,595 37	8,256

156a	Chester–Goshen	Orange	9, 1, '06	3.10								100	628 25	203
157	Woodbury–Central Valley	Orange	7, 20, '06	3.48	18	22	Emb. 4,741	Gravel	None	Gravel	None	90		
158	Northampton	Montg'm'y	9, 1, '06	0.70	14	22	2,416	Local fld	Sand	Local fld	Same	100	7,565 00	10,807
159	Middletown–Slate Hill	Orange	6, 15, '04	3.49		22	5,731	Gravel	None	Gravel	None	100	15,845 90	4,569
160	Slate Hill–Unionville	Orange	6, 18, '04	8.38	12	22	5,609	Gravel	None	Gravel	None	100	50,879 44	6,072
161	Newburgh–Shawangunk	Orange	6, 18, '04	8.61	12	20	3,310	Local stone	Same	Lo. & sh.	Same	85		
162	Oneonta	Otsego	6, 9, '04	1.39	14	20	2,968	Local stone	Sand	Local stone	Limestone	100	11,860 57	8,533
163	Broadway–Fort Hunter	Schen'ct'dy	6, 17, '04	1.71	16	22	2,193	Limestone	Sand	Limestone	Same	100	14,907 00	8,717
164	Downesville	Delaware		4.20		16	6,000							
165	Little Ridge, Sec. 2	Monroe	6, 14, '04	2.062	16	22	1,625	Sandstone	Sand & Sam.	Granite	Granite & San	100	14,972 38	7,261
166	Penfield, Sec. 1	Monroe	6, 7, '04	3.635	14–16	20–22	3,411	Limestone	Sand	Limestone	Same	100	29,337 63	8,071
166a	Penfield, Sec. 1	Monroe		3.635								100	162 38	45
167	Penfield, Sec. 2	Monroe	6, 17, '04	5.313	12–14–16	18–20–22	2,070	Local fld	Sand	Granite	Gran & fld	100	32,200 00	6,061
167a	Penfield, Sec. 2	Monroe		5.313								100	870 45	164
168	Dugway, Sec. 1	Monroe	6, 17, '04	3.300	14–15–16	20–21–22	Emb. 8,258	Local fld	Sand	Local li	Same	100	34,800 00	10,545
169	Dugway, Sec. 2	Monroe	6, 18, '04	4,019	12	18	1,592	Local li	Sand	Local li	Same	100	21,012 75	5,228
170	Dugway, Sec. 3	Monroe	6, 17, '04	2.88	12	18	1,774	Local li	Sand	Local li	Same	100	15,374 36	5,338
171	Lake, Sec. 1	Monroe	6, 14, '04	2.00	16	22	1,915	Local li	Sand	Local li.	Same	100	14,398 92	7,199
172	Portland Avenue, Sec. 1	Monroe	10, 15, '04	0.703	16	22	Emb. 2,297	Local li	Sand	Local li	Same	100	7,391 20	10,513
173	Hudson Avenue, Sec. 2	Monroe	10, 15, '04	0.995	16	22	1,420	Limestone	Sand	Limestone	Same	100	9,069 86	9,115
174	Endicott	Broome	6, 16, '04	2.17	16	22–27	3,180	Fieldstone	Same	Trap-rock	Limestone	100	22,500 00	10,368
175	Chenango Tow-path	Broome	6, 16, '04	1.836	12	16	Emb. 1,514	Fieldstone	Same	Trap-rock	Limestone	100	13,492 10	7,348
176	Albany–Schenectady	Albany	7, 26, '04	2.31	16	32	2,165	Limestone	Sand	Limestone	Same	100	21,447 00	9,284
177	Schoharie, Sect. 1-2	Albany	6, 9, '04	5.00	14–16	20–22	3,240	Local fld	Sand	Limestone	Same	100	42,921 55	8,544
178	Delaware Turnpike, Sec. 3	Albany	6, 8, '04	7.38	12	20	5,312	Limestone	Sand	Limestone	Same	100	85,886 28	11,637
178a	Delaware Turnpike, Sec. 3	Albany	10, 16, '06	7.38								100	3,094 45	419
179	Schenectady–Albany	Schen'ct'dy	6, 17, '04	2.35	16	32	3,830	Limestone	Sand	Limestone	Same	100	28,510 67	12,132
180	East Mohawk Turnpike	Montg'm'y	6, 17, '04	2.82	16	22	3,794	Limestone	Sand	Limestone	Same	100	26,175 03	9,282
180a	East Mohawk Turnpike	Montg'm'y	11, 7, '06	2.82								100	924 97	328
181	W't'n–S. H'b'r–Hend'n, Sec. 1	Jefferson	6, 16, '04	6.04	12	26	3,013	Limestone	Sand	Limestone	Same	100	47,848 30	7,922
182	Redwood–Alex. Bay, Sec. 1	Jefferson	7, 14, '04	2.976	12	25	1,613	Local san	Sand & sam	Lo qua gran	Same	100	30,645 57	10,297
183	Adams–Henderson, Sec. 1	Jefferson	6, 18, '04	3.03	12	26	Emb. 2,706	Gran b'ld'rs	Sand & sam	Gran b'ld'rs	Same	100	21,900 00	7,228
184	Pierrepont Manor–Ellisburg	Jefferson	6, 16, '04	2.955	12	26	2,809	Gran b'ld'rs	Sand	Limestone	Same	100	21,321 45	7,119
185	State	Jeffesron	6, 15, '04	1.0	12	26	5,800	Gran b'ld'rs	Sand	Gran b'ld'rs	Same	100	8,792 15	8,792
186	Depot	Jefferson	10, 19, '04	0.99	12–16	26	2,043	Limestone	Sand	Limestone	Same	100	6,800 00	6,868
187	Bristol	Ontario	6, 11, '04	1.720	12–16		2,442	Le Roy li	Sand	Le Roy li	Same	100	15,517 26	9,022
188	Bristol Valley, Sec. 1	Ontario	7, 14, '04	4.830	12	18	Emb. 2,600	Lo fld	Sand	Lo gran fld	Same	100	39,346 56	8,146
188a	Bristol Valley, Sec. 1	Ontario		4.830								100	153 00	32
189	East Side–Lake, Sec. 2	Ontario	6, 10, '04	1.286	12	18	2,177	Le Roy li	Sand	Le Roy li	Same	100	11,092 66	8,626
109	East Side–Lake, Sec. 1	Ontario	6, 10, '04	2,368	12	18	1,848	Local stone	Sand	Lo fld	Same	100	18,200 00	7,685
190a	East Side–Lake, Sec. 1	Ontario		2.368								100	500 00	211
191	Honeoye–Hemlock	Ontario	6, 17, '04	4.549	12	18	3,526	Gran b'ld'rs	Sand	Gran b'ld'rs	Same	100	38,662 82	8,499

ROADS FOR WHICH CONTRACTS HAVE BEEN AWARDED UNDER CHAPTER 115, LAWS OF 1898, AND CHAPTER 468, LAWS OF 1906, TO OCTOBER 1, 1907 — (Continued).

Road number.	NAME OF ROAD.	County.	Date of contract.	Length in miles.	Width of macadam.	Width of roadway.	Cubic yards excavation per mile.	MATERIALS.				Per cent completed.	TOTAL COST COMPLETED.	
								BOTTOM. (Usually 4 inches thick after rolling.)		TOP. (Usually 2 inches thick after rolling.)			Whole.	Per mile.
								Kind of crushed rock.	Kind of screenings or sand as filler.	Kind of crushed rock.	Kind of screenings or sand as filler.			
					Feet.	Feet.								
191a	Honeoye-Hemlock	Ontario	...	4.549	...	...	...	...	...	...	...	100	$1,162 82	$256
192	Beaver Dam	Albany	6, 9, '04	3.54	14	20	3,616	Limestone	Sand	Limestone	Same	100	35,867 04	10,031
193	River	Albany	6, 11, '04	8.13	12-14-16	26	4,055	Limestone	Sand	Trap-rock	Limestone	100	69,055 56	8,493
193a	River Road	Albany	5, 29, '06	8.13	...	...	...	...	...	...	...	100	8,234 46	1,013
194	Sand Lake-Troy	Rensselaer	6, 10, '04	1.49	14-20	22	3,812	Limestone	Sand	Limestone	Same	100	15,042 55	10,096
195	Wynantskill-W. Sand Lake	Rensselaer	6, 23, '04	4.01	14	22	3,092	Limestone	Sand	Limestone	Same	100	38,773 72	9,669
196	East Nassau	Rensselaer	6, 23, '04	3.02	...	18	3,344	Gravel	None	Gravel	None	100	14,252 50	4,719
196a	East Nassau	Rensselaer	8, 18, '06	3.02	...	...	...	...	...	...	...	100	744 50	247
197	Brick Church-Rock Hollow	Rensselaer	6, 13, '04	3.33	14	20	3,172	Local fld	Sand	Local fld	Same	100	33,440 94	10,042
198	Delaware Turnpike, Sec. 4	Albany	6, 9, '04	6.527	12	20	6,833	Limestone	Sand	Limestone	Same	100	66,967 87	10,260
199	Delaware Turnpike, Sec. 5	Albany	6, 9, '04	7.871	12	20	4,828	Local stone	Sand & sam	Local stone	Same	100	61,070 47	7,758
200	Old Northern Turnpike	Rensselaer	7, 12, '04	2.75	14-20	20	2,746	Limestone	Sand	Limestone	Same	100	26,244 31	9,543
201	Troy-Poestenkill	Rensselaer	6, 13, '04	3.60	14-16	22	2,014	Limestone	Sand	Limestone	Same	100	30,472 24	8,465
201a	Troy-Poestenkill	Rensselaer	12, 13, '06	3.60	...	...	...	...	...	...	...	100	2,977 76	827
202	Boston-Albany	Rensselaer	6, 20, '04	5.42	16	30	3,000	Local shale	Sand	Trap-rock	Local shale	100	51,264 27	9,458
202a	Boston-Albany	Rensselaer	4, 30, '06	5.42	...	...	...	...	...	...	...	100	600 00	110
203	Gorham-Stanley	Ontario	6, 10, '04	2.197	12-16	18-22	3,560	Le Roy li	Sand	Le Roy li	Same	100	19,295 27	8,783
203a	Gorham-Stanley	Ontario	9, 19, '06	2.197	...	...	...	...	...	...	...	...	...	...
204	Naples-Atlanta	Ontario	6, 11, '04	0.585	12	18	1,538	Le Roy li	Sand	Le Roy li	Same	100	5,348 84	9,143
205	Naples-Woodville	Ontario	6, 16, '04	3.451	12	18	5,368	Le Roy li	Sand	Le Roy li	Same	100	39,000 00	11,301
206	Reeds Corners	Ontario	7, 10, '06	2.669	12	18	1,922	Local gr	Sand	Local gr	Same	100	20,646 70	7,736
207	Geneva-Canandaigua, Sec. 2	Ontario	7, 14, '04	6.213	14	22	2,245	Local "bl"	Sand	Local "bl"	Same	100	52,432 38	8,438
208	Cortland-Homer	Cortland	12, 31, '06	0.54	16, 20	...	3,111	Limestone	Sand	Trap-rock	Limestone	8	...	...
209	Nineveh	Broome	6, 16, '04	0.934	16	24-28	1,852	Fieldstone	Same	Limestone	Same	100	7,539 68	8,072
210	Harpursville	Broome	6, 16, '04	0.85	16-20	26-28	3,647	Fieldstone	Same	Limestone	Same	100	11,281 63	13,272
211	Center Village	Broome	6, 16, '04	0.574	12-16	24	4,007	Fieldstone	Same	Limestone	Same	100	4,639 71	8,083
212	Ouaquaga	Broome	6, 16, '04	1.01	12-16	24	3,218	Fieldstone	Same	Limestone	Same	100	8,957 86	8,899
213	River Road, Windsor, Sec. 2	Broome	6, 16, '04	2.828	16	28	4,102	Fieldstone	Same	Limestone	Same	100	31,144 44	11,013
214	River Road, Windsor, Sec. 1	Broome	6, 16, '04	1.868	14	28	4,122	Fieldstone	Same	Limestone	Same	100	15,911 77	8,518

215	Dryden	Cortland	6, 13, '04	2.00	16	28	Emb. 2,250	Fieldstone	Same	Limestone	Same	100	15,412 00	7,706
216	Roxbury	Delaware	7, 14, '04	0.95	18-35	18-35	1,821	Local "bl"	Same	Local "bl"	Same	100	10,787 29	11,355
217	Grand Gorge	Delaware	7, 14, '04	1.00	14	20	2,820	Local stone	Sand	Local stone	Same	100	9,569 47	9,569
218	Greene-Smithville Flats	Chenango	7, 13, '04	4.68	12	26	3,205	Local "bl"	Sand	Limestone	Local "bl"	100	37,700 00	8,055
219	Richfield Spa-Cherry Valley	Otsego	8, 6, '04	0.68	14	20	3.309	Limestone	Sand	Limestone	Same	100	6,488 33	7,541
220	Worcester	Otsego	7, 14, '04	0.98	16-50	22-50	1,880	Limestone	Sand	Limestone	Same	100	10,752 61	10,972
221	Edmeston	Otsego	6, 14, '04	0.50	22	24	2,500	Crushed gr.	Same	Limestone	Same	100	7,221 15	14,412
222	Hughsonville	Dutchess	6, 13, '04	3.467	14-20	20	3,547	Fieldstone	Sand	Fieldstone	Same	100	31,979 04	9,224
223	South	Dutchess	7, 20, '04	3.904	16	22	2,869	Limestone	Sand	Trap-rock	Limestone	100	44,301 79	11,347
224	Oxford-McDonough	Chenango	7, 9, '04	5.82	10	22	Emb. 2,577	Fieldstone	Same	Local "bl"	Same	100	37,548 06	6,451
225	Guilford	Chenango	7, 13, '04	5.75	12-16	26-28	1,922	Fieldstone	Sand	Limestone	Fieldstone	100	47,588 71	8,276
227	Brunswick Turnpike	Rensselaer	7, 9, '06	3.100	14	24-28	2,188	Local stone	Sand	Trap-rock	Local stone	78	....	....
228	Saugerties-Kingston	Ulster	6, 29, '06	5.66	14, 16	24,26,28	2,814	Local stone	Sand	Local stone	Same	97	....	....
228a	Saugerties-Kingston	Ulster	12, 7, '06	5.66	....	....	....	....	....	....	....	100	3,800 00	671
229	Kingston-High Falls	Ulster	10, 1, '06	6.93	14	....	....	Local stone	Sand	Local stone	Same	....	....	....
230	Kingston-Ellenville, Sec. 1	Ulster	7, 11, '06	8.27	16	24,26,28	3,064	Local stone	Sand	Local stone	Same	19	....	....
231	Post, Sec. 1	Ulster	7, 7, '06	7.08	14	26	3,639	Local stone	Sand	Local stone	Same	74	....	....
232	Old State	Essex	7, 9, '06	2.64	14	28, 30	1,984	Local stone	Sand	Local stone	Same	100	21,000 00	7,955
233	Frankford-E. Schuyler	Herkimer	7, 9, '06	1.64	16	26	2,043	Local stone	Sand	Trap-rock	Same	97	....	....
234	Adams-Henderson, Sec. 2	Jefferson	7, 7, '06	6.89	12	22-26	2,279	Limestone	Sand	Limestone	Same	49	....	....
235	Wat'n-Sack. H'bor-Hds'n, Se. 2	Jefferson	7, 7, '06	2.23	12, 16	26	Emb. 1,009	Limestone	Sand	Limestone	Same	97	....	....
236	Redwood-Alex. Bay, Sec. 2	Jefferson	9, 20, '07	4.19	12-16-20	24-26 28-40	1,470	....	....	....	....	....	....	....
237	Sacketts Harbor	Jefferson	7, 9, '06	1.45	16	26	Emb. 2,207	Limestone	Sand	Limestone	Same	100	12,700 00	8,759
238	Henderson Harbor	Jefferson	7, 7, '06	5.09	12	22, 24	1,660	Limestone	Sand	Limestone	Same	63	....	....
239	Delhi-Middletown	Delaware	8, 30, '06	4.96	14, 16	25, 26	5,586	Local stone	Sand	Local stone	Same	74	....	....
240	Cohoes-Waterford	Saratoga	7, 3, '06	1.00	35	35	2,168	Concrete	Sand	Vit. brick	....	55	....	....
241	Saratoga-Ballston	Saratoga	7, 13, '06	4.335	16	32	1,996	Local stone	Sand	Trap-rock	Same	46	....	....
242	Saratoga-Glens Falls, Sec. 2	Saratoga	7, 13, '06	1.25	14	26	2,301	Local stone	Sand	Trap-rock	Same	96	....	....
243	Mechanicville-Stillwater	Saratoga	7, 9, '06	1.84	16	28	Emb. 3,960	Local stone	Sand	Trap-rock	Same	10	....	....
244	Saratoga-Schuylerville	Saratoga	7, 9, '06	6.01	14	24, 26	3,861	Approved st.	Sand	Trap-rock	Same	54	....	....
245	Coleman Hill, Sec. 1	Onondaga	9, 20, '07	1.21	12	22-24-26	6,364	....	....	....	....	....	....	....
246	Gloversville-Meco-Phelps	Fulton	7, 12, '06	2.03	14, 16	26	2,360	Approved st.	Sand	Approved st.	Same	93	....	....
247	J'nst'n-Keck's Center, Sec. 2	Fulton	7, 9, '06	4.67	12, 14	22, 24	5,001	Local stone	Sand	Local stone	Same	46	....	....
248	Gloversville-Broadalbin	Fulton	9, 1, '06	2.02	12	24	3,676	Local stone	Sand	Local stone	Same	25	....	....
249	Old Plank	Fulton	7, 6, '06	3.14	14	24,28,32	2,323	Local stone	Sand	Local stone	Same	100	28,000 00	8,917
250	Utica-Oneida Castle, Sec. 1	Oneida	7, 10, '06	8.53	16-23	22,23,32	3,693	Limestone	Sand	Li and gneiss.	Limestone	91	....	....
251	Griswold Street	Niagara	7, 5, '06	3.15	12	18	1,687	Li or lo stone.	Sand	Limestone	Same	100	18,379 79	5,835
252	Clifton, Sec. 2	Monroe	7, 11, '06	2.92	12	18	1,812	Lo fld	Sand	Limestone	Same	100	21,623 00	7,405
253	Lyell	Monroe	7, 11, '06	2.12	16, 20	26, 30	2,370	Li or lo stone.	Sand	Limestone	Same	90	....	....
254	Chili, Sec. 1	Monroe	7, 11, '06	3.11	16	22	1,951	Li or lo stone.	Sand	Limestone	Same	....	....	....
255	Chili, Sec. 2	Monroe	7, 11, '06	2.56	16	22	2,285	Li or lo stone.	Sand	Limestone	Same	....	....	....
256	Little Ridge, Sec. 3	Monroe	7, 13, '06	3.60	16	28	1,705	Lo fld	Sand	Local gran.	Same	86	....	....

ROADS FOR WHICH CONTRACTS HAVE BEEN AWARDED UNDER CHAPTER 115, LAWS OF 1898, AND CHAPTER 468, LAWS OF 1906, TO OCTOBER 1, 1907 — (Continued).

Road number.	NAME OF ROAD.	County.	Date of contract.	Length in miles.	Width of macadam.	Width of roadway.	Cubic yards excavation per mile.	MATERIALS. Bottom. (Usually 4 inches thick after rolling.)		Top. (Usually 2 inches thick after rolling.)		Per cent completed.	TOTAL COST COMPLETED.	
								Kind of crushed rock.	Kind of screenings or sand as filler.	Kind of crushed rock.	Kind of screenings or sand as filler.		Whole.	Per mile.
					Feet.	Feet.								
257	Little Ridge, Sec. 4	Monroe	7, 11, '06	3.36	16	22	1,339	Lo fld	Sand	Local gran	Same	100	$26,250 00	$7.813
258	Plattsburg-Keeseville, Sec. 3	Clinton	7, 9, '06	5.44	14, 16	28-32	Emb. 1,817	Local stone	Sand	Local stone	Same	98	....	....
259	Plattsburg-Mooers, Sec. 2	Clinton	7, 6, '06	7.34	14	28	Emb. 2,635	Local stone	Sand	Limestone	Same	97	....	....
260	Plattsburg-Mooers, Sec. 3	Clinton	8, 1, '06	4.31	14	26, 28	2,023	Local stone	Sand	Local stone	Same	44	....	....
261	Peekskill-Salem Center, Sec. 1	Westchest.	7, 6, '06	5.86	14, 16	24-32	2,129	Local stone	Sand	Local stone	Same	17	....	....
262	Peekskill-Salem Center, Sec. 2	Westchest	7, 6, '06	4.66	14	24	1,928	Local stone	Sand	Local stone	Same	94	....	....
263	Aurora-Buffalo, Sec. 2	Erie	7, 18, '06	4.23	16	22-32	2,381	Li or lo stone	Sand	Limestone	Same	54	....	....
264	Aurora-Buffalo, Sec. 3	Erie	7, 10, '06	0.74	16	22	2,007	Li or lo stone	Sand	Limestone	Same	82	....	....
265	Deposit	Broome	7, 12, '06	2.78	14	23	3,381	Fieldstone	Sand	Trap-rock	Limestone	71	....	....
266	Tunnel	Broome	7, 12, '06	1.70	12	26	Emb. 2,529	Fieldstone	Sand	Trap-rock	Limestone	35	....	....
267	Castle Creek	Broome	7, 12, '06	6.00	12	23-26	Emb. 2,133	Fieldstone	Sand	Fld	Same	86	....	....
268	Bridge	Broome	7, 12, '06	1.00	12, 16	26, 28	3,447	Fieldstone	Sand	Trap-rock	Limestone	100	10,629 79	10,630
269	Hilton	Monroe	7, 11, '06	4.30	12	18	1,817	Lo fld	Sand	Local gran	Same	93	....	....
270	Birch Hill	Nassau	7, 10, '06	1.16	16	32	3,095	Trap-rock	Sand	Trap-rock	Same	100	11,728 24	10,111
271	Utica-Oneida Castle, Sec. 2	Oneida	9, 15, '06	8.53	16	32	2,849	Limestone	Sand	Li and gneiss	Limestone	12	....	....
272	Orchard Park, Sec. 5	Erie	7, 10, '06	1.21	16	28	2,256	Limestone	Sand	Limestone	Same	100	13,700 00	11,322
274	Gulf Bridge, Sec. 1	Broome	7, 12, '06	1.75	12	24-26	4,514	Fieldstone	Sand	Fieldstone	Same	92	....	....
275	Union-Maine	Broome	7, 12, '06	3.04	12	24	Emb. 3,476	Fieldstone	Sand	Fieldstone	Same	22	....	....
276	Barnards Crossing, Secs. 1 and 2	Monroe	7, 13, '06	4.14	16	22	2,174	Lo fld	Sand	Limestone	Same	100	39,200 00	9,469
277	Lake Pleasant-Speculator	Hamilton	7, 12, '06	3.44	12	26	Emb. 3,427	Local stone	Sand	Local stone	Same	17	....	....
278	Syracuse-Watertown	Oswego	9, 20, '07	2.41	16	26	1,772	....	....	....	....	....	....	....
279	West Oswego River	Oswego	9, 20, '07	2.48	16	28	2,067	....	....	....	....	....	....	....

280	Oswego-Sterling	Oswego	9, 18, '06	1.66	16	26	Emb. 1,386	Fieldstone	Sand	Trap-rock	Limestone	86	....	....
282	Greenville-Slate Hill	Orange	8, 30, '06	7.13	12	26	5,007	Local stone	Sand	Local stone	Same	49	....	....
283	Greenville-Port Jervis	Orange	9, 4, '06	5.11	12	28	8,395	Local stone	Sand	Local stone	Same	31	....	....
284	Averill Park-Crooked Lake	Rensselaer	7, 2, '06	3.61	14,16,20	26	2,431	Local stone	Sand	Local stone	Same	77	....	....
285	Nassau-Brainard	Rensselaer	7, 7, '06	3.65	12	24-26	5,507	Local stone	Sand	Local stone	Same	88	....	....
286	Left Fork-German Church-Redman Road	Monroe	9, 20, '07	5.55	12	28	2,033	Local stone	Sand	Granite	....	....	....	....
287	Rensselaer-Best	Rensselaer	8, 30, '06	4.75	12, 20	26	Emb. 3,023	Local stone	Sand	Local stone	Same	81	....	....
288	Troy-Sand Lake, Sec. 2	Rensselaer	7, 3, '06	3.72	18	28	2,029	Gravel	None	Gravel	None	100	16,867 35	4,534
289	Crescent Avenue	Suffolk	9, 3, '07	1.91	16	....	....	Approved st.	Sand	Trap-rock	Same	....	....	....
290	South Salina Street	Onondaga	8, 31, '06	1.06	16	26	Emb. 1,981	Limestone	Sand	Syenite	Limestone	78	....	....
292	West Lake, Sec. 2	Onondaga	7, 10, '06	1.00	16	26	Emb. 2,500	....	....	....	....	....	....	....
293	East Lake, Sec. 2	Onondaga	7, 10, '06	1.00	16	26	Emb. 2,100	Fieldstone	Sand	Limestone	Same	38	....	....
294	Clover Street, Sec. 1	Monroe	9, 17, '07	5.89	12	24-32	3,108	Local stone	Sand	Lo gran. fld.	Lo stone	25	....	....
295	Mohawk River Road, Floyd	Oneida	7, 10, '06	2.80	16	26	2,929	Limestone	Sand	Gneiss	Limestone	65	....	....
296	Mohawk River Road, Marcy	Oneida	7, 10, '06	4.54	16	26	Emb. 2,844	Limestone	Sand	Gneiss	Limestone	90	....	....
297	Mohawk River R'd, Deerfield	Oneida	7, 10, '06	3.74	16	26	Emb. 1,568	Limestone	Sand	Gneiss	Limestone	100	43,100 00	11,524
298	Amsterdam-Hagaman	Montg'm'y	7, 9, '06	2.20	14	24	1,856	Local stone	Sand	Local stone	Same	10	....	....
299	Saulwater's Cor's-Young's Cor's	Montg'm'y	7, 11, '06	2.77	12	22	4,034	Local stone	Sand	Local stone	Same	92	....	....
300	DeGraff's Cor's-Sherburne's Cor's	Montg'm'y	7, 11, '06	1.13	12	22	2,090	Local stone	Sand	Local stone	Same	100	10,200 00	9,027
301	Minaville-Scotch Bush	Montg'm'y	7, 9, '06	2.34	12	22,24,26	1,747	Local stone	Sand	Local stone	Same	100	16,000 00	6,838
302	Fonda-Berryville	Montg'm'y	7, 9, '06	2.00	14	24	Emb. 3,295	Local stone	Sand	Trap-rock	Same	100	17,300 00	8,650
303	Fonda-Tribes Hill	Montg'm'y	9, 3, '07	2.21	16	....	....	Approved st.	Sand	Trap-rock, gran. or gneiss	Same	....	....	....
304	Sprakers-Rural Grove	Montg'm'y	9, 3, '07	5.66	14	....	....	Approved st.	Sand	Approved st.	Same	....	....	....
305	Kingston-Ellenville, Sec. 2	Ulster	7, 3, '06	7.25	16	22,26,28	4,218	Local stone	Sand	Local stone	Same	46	....	....
306	Kingston-Ulster Landing	Ulster	9, 3, '07	5.564	16	....	....	Approved st.	Sand	Trap-rock	Same	....	....	....
307	Plattekill-Modena	Ulster	9, 3, '07	7.16	14	....	....	Approved st.	Sand	Approved st.	Limestone	....	....	....
312	Middlet'wn-Cud'backville, Sec.1.	Orange	9, 4, '06	4.396	12	22	4,595	Local stone	Sand	Local stone	Same	54	....	....
313	Middletown-Cuddebackville	Orange	9, 3, '07	5.18	12	....	....	Approved st.	Sand	Approved st.	Same	....	....	....
314	Gilbertsville-Mt. Upton	Otsego	6, 30, '06	4.37	16	26,28	3,368	Local stone	Sand	Local stone	Same	47	....	....
315	Morris-Gilbertsville, Sec. 1	Otsego	7, 9, '06	3.537	16	24-26	2,679	Local stone	Sand	Local stone	Same	79	....	....
316	Colliers-Emmons	Otsego	7, 10, '06	1.26	16	26-28	3,059	Local stone	Sand	Local stone	Same	100	12,750 00	10,119
317	Shady Side-Otego	Otsego	7, 10, '06	2.73	16	28	Emb. 2,256	Limestone Lo qua stone	Same Same	Limestone Trap-rock	Same Same & li.	....	....	....
318	Colliersville-Milford Center	Otsego	6, 30, '06	2.03	14	24	4,169	Local stone	Sand	Local stone	Same	100	18,871 15	9,296
319	Schenevus-Maryland	Otsego	6, 30, '06	3.66	16	22, 26, 32	4,058	Limestone	Sand	Limestone	Same	97	....	....
320	Reservation Road, Fayette	Seneca	9, 18, '07	5.72	16	28	1,171	....	....	....	....	....	....	....
328	Valley Road-Marcellus	Onondaga	8, 31, '06	1.31	12	26	4,484	....	....	....	....	5	....	....

ROADS FOR WHICH CONTRACTS HAVE BEEN AWARDED UNDER CHAPTER 115, LAWS OF 1898, AND CHAPTER 468, LAWS OF 1906, TO OCTOBER 1, 1907 — (Continued).

Road number.	NAME OF ROAD.	County.	Date of contract.	Length in miles.	Width of macadam.	Width of roadway.	Cubic yards excavation per mile.	MATERIALS.				Per cent completed.	TOTAL COST COMPLETED.	
								BOTTOM. (Usually 4 inches thick after rolling.)		TOP. (Usually 2 inches thick after rolling.)			Whole.	Per mile.
								Kind of crushed rock.	Kind of screenings or sand as filler.	Kind of crushed rock.	Kind of screenings or sand as filler.			
					Feet.	Feet.								
329	Valley Road-Camillus	Onondaga	11, 23, '06	2.32	12	24-26	4,828	Limestone	Sand	Limestone	Same	51		
330	Skaneateles-Hamilton Turnpike, Sec. 1	Onondaga	9, 20, '07	2.44	14	22-24 26-28	3,893							
331	Peekskill-Salem Center, Sec. 3	Westchest.	7, 20, '06	3.88	14, 16	26-28	2,921	Local stone	Sand	Local stone	Same	30		
332	Peekskill-Salem Center, Sec. 4	Westchest.	7, 20, '06	3.23	14	24-28	4,585	Local stone	Sand	Local stone	Same	48		
333	Geneva-Canandaigua, Sec. 3	Ontario	7, 10, '06	1.09	14	22	2,867	Limestone	Sand	Limestone	Same	100	$9,385 93	$8,611
334	Lyons-Geneva	Ontario	7, 10, '06	1.69	16	32	1,982	Limestone	Sand	Limestone	Same	100	15,153 43	8,967
335	Victor-Mendon, Sec. 1	Ontario	7, 5, '06	5.20	12	24-32	2,841	Local stone	Sand	Limestone	Same	100	41,295 40	7,941
336	Cayuga Heights	Tompkins	8, 30, '06	3.17	12	24, 26, 28	Emb. 6,151	Fieldstone	Sand	Limestone	Same	14		
337	Syracuse Turnpike	Madison	9, 20, '07	1.58	12	26	2,136							
338	Catskill-Turnpike, Sec. 2	Tompkins	8, 30, '06	1.38	16	26	4,891	Fieldstone	Sand	Limestone	Same	36		
339	Georgetown	Madison	9, 18, '06	3.29	12, 16	22, 26	3,040	Bluestone	Sand	Limestone	Same	18		
340	Saratoga-Corinth	Saratoga	7, 6, '06	7.25	14	28	2,595	Local stone	Sand	Trap-rock	Limestone	57		
341	Stockport-Hudson	Columbia	7, 6, '06	2.60	16	26-28	Emb. 2,151	Local stone	Sand	Trap-rock	Same	69		
342	Chatham-Chatham Center	Columbia	8, 28, '06	1.12	16	24	7,501	Gravel	None	Gravel	None	52		
343	Pawling-Patterson	Dutchess	7, 7, '06	2.23	14	24-26	Emb. 3,928	Local stone	Sand	Local stone	Same	100	24,078 97	10,798
344	Millerton-Northeast Center	Dutchess	7, 9, '06	1.78	14	24-26	4,284	Local stone	Sand	Local stone	Same	100	17,950 01	10,084
348	Collamer	Onondaga	7, 9, '06	1.90	16	26	Emb. 1,842	Limestone	Sand	Limestone	Same	98		
356	Erin-Horseheads	Chemung	7, 7, '06	9.22	16	24-32	Emb. 2,282	Limestone	Sand	Limestone	Same	95		
357	Grand Central Ave.	Chemung	9, 13, '06	1.57	16	28-32	2,051	Limestone	Sand	Trap-rock	Limestone	100	15,754 30	10,035
359	Frankfort-Utica, Sec. 2	Herkimer	7, 10, '06	1.89	16	26	2,711	Local stone	Sand	Trap-rock	Same	77		
360	Poland-Cold Brook	Herkimer	7, 2, '06	0.35	16	26	3,006	Local stone	Sand	Trap-rock	Same	100	4,150 0[illegible]	11,857
361	Johnstown-Tribes Hill, Sec. 1	Fulton	7, 9, '06	2.22	16	26	4,041	Local stone	Sand	Local stone	Same	93		
362	Northville-Chapman's Cors.	Fulton	9, 3, '07	1.71	14			Approved at	Sand	Trap-rock	Same			
363	Mayfield-Northville, Sec. 1	Fulton	9, 3, '07	1.37	14			Approved at	Sand	Approved at	Limestone			
364	Preston Hollow-Potter Hollow	Albany	7, 12, '06	3.13	14	24-26	3,304	Local stone	Sand	Local stone	Same	43		

365	Guilderland Center–Guilderland	Albany....	7, 3, '06	1.89	14	24	2,662	Local stone..	Sand........	Trap-rock...	Same........	100	16,847 42	8,914
366	New Scotland–Wolf Hill........	Albany....	7, 11, '06	6.85	12, 14	24	5,102	Local stone..	Sand........	Local stone..	Same........	100	78,422 97	11,449
367	Glenmont-Feura Bush..........	Albany....	7, 6, '06	6.77	12	22–24	2,802	Local stone..	Sand........	Limestone...	Same........	100	62,750 00	9,269
368	Augusta Road–Augusta.........	Oneida....	11, 23, '06	3.38	14	28	Emb. 2,663	Limestone...	Same........	Limestone...	Same........	9	....	....
369	Augusta Road–Oriskany Falls..	Oneida....	8, 29, '06	2.99	14	22	Emb. 2,408	Limestone...	Sand........	Limestone...	Same........	91	....	....
370	Minetto.....................	Oswego....	9, 18, '06	0.48	16	26	4,479	Fieldstone...	Sand........	Trap-rock...	Limestone...	100	6,750 00	14,063
371	Clinton Street, Sec. 1...........	Erie.......	7, 18, '06	5.65	16	24–28	1,693	Limestone...	Sand........	Limestone...	Same........	45	....	....
372	Clinton Street, Sec. 2...........	Erie.......	7, 18, '06	6.14	16	24–28	2,007	Limestone...	Sand........	Limestone...	Same........	12	....	....
373	Goodrich Road................	Erie.......	7, 9, '06	8.77	12, 16	16–32	3,130	Limestone...	Sand........	Limestone...	Same........	27	....	....
374	Maine.......................	Broome...	7, 12, '06	3.37	12	20–26–28	2,801	Fieldstone...	Sand........	Fieldstone...	Same........	4	....	....
375	Barker......................	Broome...	7, 12, '06	0.62	16	28	Emb. 3,282	Fieldstone...	Sand........	Trap-rock...	Limestone...	86	....	....
376	Gloversville–Bull Run..........	Fulton....	9, 3, '07	2.38	12	....	....	Approved st..	Sand........	Approved st.	Same........	....	....	....
377	Cincinnatus..................	Cortland...	7, 10, '06	0.42	16	26	Emb. 1,571	Limestone...	Sand........	Limestone...	Same........	100	4,000 00	9,524
378	McGrawville..................	Cortland...	7, 10, '06	2.92	12, 16	24, 26	Emb. 2,203	Fieldstone...	Sand........	Limestone...	Same........	92	....	....
379	Harford.....................	Cortland...	9, 19, '06	0.91	12	26	1,648	Fieldstone...	Sand........	Limestone...	Same........	....	....	....
380	State Road–Homer............	Cortland...	11, 14, '06	4.39	12	24	Emb. 2,825	Fieldstone...	Sand........	Limestone...	Same........	23	....	....
381	State Road–Scott.............	Cortland...	9, 20, '07	2.72	12–16	24–26	1,728	....	....	....	....	....	....	....
383	Owasco.....................	Cayuga....	7, 10, '06	2.19	16	24–26	Emb. 1,336	Limestone...	Sand........	Limestone...	Same........	94	....	....
384	Fleming.....................	Cayuga....	11, 10, '06	3.17	12	24–26–28	2,366	Limestone...	Sand........	Limestone...	Same........	26	....	....
385	Albany–Schenectady, Sec. 2....	Albany....	9, 3, '07	5.14	16	....	....	Gr tr-ro gn...	Same........	Gr tr-ro gn...	Same........	....	....	....
386	Five Cor.–Kuckville, Sec. 1.....	Orleans....	8, 31, '06	3.47	12	28–32	1,288	Lo fld......	Sand........	Lo fld......	Same........	96	....	....
387	Five Cor.–Kuckville, Sec. 2.....	Orleans....	8, 31, '06	5.80	12–16	16–32	2,138	Lo fld......	Sand........	Lo fld......	Same........	14	....	....
388	Kendall's Corners.............	Orleans....	7, 9, '06	3.43	12–16	26–32	2,344	Lo fld......	Sand........	Local gran...	Same........	37	....	....
389	Maple Ridge, Sec. 1...........	Orleans....	9, 27, '07	3.08	12	24–32	2,345	Local stone..	Sand........	Limestone...	Same........	....	....	....
390	Maple Ridge, Sec. 2...........	Orleans....	9, 27, '07	2.8	12	24–32	2,214	Local stone..	Sand........	Limestone...	Same........	....	....	....
399	Latta.......................	Monroe....	9, 19, '07	6.84	16	26–32	1,976	Slag or Lo. fld	Sand........	Limestone...	Same........	....	....	....
400	Portland ave., Sec. 2..........	Monroe....	9, 24, '07	0.93	16	22–32	1,586	Local stone..	Sand........	Limestone...	Same........	....	....	....
405	Kitchawan–Croton Lake........	Westchest.	9, 3, '07	2.25	14	....	....	Approved st..	Sand........	Trap-rock...	Same........	....	....	....
406	Augusta Road–Vernon Center...	Oneida....	11, 27, '06	3.88	14	24	Emb. 1,959	....	....	Limestone...	....	79	....	....
407	Troy–Schenectady, Sec. 2.......	Schen'ct'dy	9, 4, '07	3.025	16	....	....	Gr tr-ro gn...	Same........	Gr tr-ro gn..	Same........	....	....	....
417	Glens Falls–Lake George.......	Warren....	7, 10, '06	7.56	16	24–26	2,543	Local stone..	Sand........	Trap-rock...	Same........	78	....	....
418	Lake George–Bolton Landing...	Warren....	7, 10, '06	9.74	16	26	3,387	Local stone..	Sand........	Local stone..	Same........	82	....	....
420	Vestal......................	Broome...	7, 12, '06	3.69	12–16	28	Emb. 3,008	....	....	....	....	....	....	....
423	Watertown–Theresa, Sec. 3.....	Jefferson...	9, 20, '07	4.19	12–16	22–26–28	1,420	....	....	....	....	....	....	....
424	Belleville-Adams, Sec. 1........	Jefferson...	11, 16, '06	1.60	12	26	Emb. 2,094	Limestone...	Sand........	Limestone...	Same........	97	....	....
425	Adams–Watertown, Sec. 2......	Jefferson...	7, 3, '06	3.16	12–16	24–26	3,513	Limestone...	Sand........	Limestone...	Same........	47	....	....
427	Watertown–Carthage, Sec. 2....	Jefferson...	7, 7, '06	5.47	12–16	22–24–26	Emb. 6,857	Limestone...	Sand........	Limestone...	Same........	100	42,184 15	7,712
429	Thompson....................	Onondaga.	7, 9, '06	2.83	12	24	Emb. 3,021	Limestone...	Sand........	Limestone...	Same........	81	....	....

ROADS FOR WHICH CONTRACTS HAVE BEEN AWARDED UNDER CHAPTER 115, LAWS OF 1898, AND CHAPTER 468, LAWS OF 1906, TO OCTOBER 1, 1907 — (Continued).

Road number.	NAME OF ROAD.	County.	Date of contract.	Length in miles.	Width of macadam.	Width of roadway.	Cubic yards excavation per mile.	MATERIALS. Bottom. (Usually 4 inches thick after rolling.) Kind of crushed rock.	MATERIALS. Bottom. Kind of screenings or sand as filler.	MATERIALS. Top. (Usually 2 inches thick after rolling.) Kind of crushed rock.	MATERIALS. Top. Kind of screenings or sand as filler.	Per cent completed.	TOTAL COST COMPLETED. Whole.	TOTAL COST COMPLETED. Per mile.
					Feet.	Feet.								
430	Jordan Valley, Sec. 1	Onondaga	7, 20, '06	1.72	12	24	Emb. 2,600	Fieldstone	Sand	Limestone	Same	100	$15,094 21	$8,776
431	Skaneateles-Spafford	Onondaga	7, 20, '06	2.50	12	22-24	Emb. 4,428	Fieldstone	Sand	Limestone	Same	38		
432	Rhinebeck-Hyde Park	Dutchess	8, 31, '06	3.26	16	26-30	6,009	Local stone	Sand	Local stone	Same	55		
433	Chazy-Chazy L'dg-Ober's Cor's	Clinton	9, 1, '06	4.60	14	26	2,323	Local stone	Sand	Local stone	Same	3		
434	Arrandale-Bay View	Nassau	7, 10, '06	1.69	12	26	1,459	Local stone	Sand	Trap-rock	Same	100	16,323 58	9,659
435	South Glenwood-Meeting House	Nassau	9, 1, '06	1.94	12, 16	24-26	2,754	Local stone	Sand	Trap-rock	Same	100	22,357 96	11,525
436	Jericho Turnpike-Plainview	Nassau	9, 1, '06	6.98	12	26-28	2,490	Local stone	Sand	Trap-rock	Same	93		
437	Jerusalem Ave.-Front St	Nassau	9, 4, '07	7.09	14			Trap-rock	Sand	Trap-rock	Same			
438	Augusta Rd.-Lowell & Spencer	Oneida	8, 29, '06	7.10	14, 16	24-26	Emb 1,746	Limestone	Sand	Limestone	Same	69		
439	East Nassau-Brainard	Rensselaer	9, 4, '07	3.78	12			Approved st.	Sand	Approved st.	Same			
441	Saratoga-Glens Falls, Secs. 4 & 5	Saratoga	8, 31, '06	8.32	14	24-26	2,550	Local stone	Sand	Local stone	Same	58		
442	Saratoga-Gansevoort	Saratoga	9, 4, '07	6.14	12			Approved st.	Sand	Trap-rock	Same			
443	Saratoga-Greenfield-Schuylerville-Glens Falls	Saratoga	9, 4, '07	6.28	14			Approved st.	Sand	Trap-rock	Same			
446	Cortland-Groton, Sec. 1	Cortland	7, 10, '06	1.35	16	28	1,926	Fieldstone	Sand	Limestone	Same	100	10,892 31	8,068
450	Phœnix-Pennellville	Oswego	9, 20, '07	1.92	12-16	26	1,875							
452	Cicero-South Bay	Onondaga	7, 9, '06	3.53	16	26	Emb. 1,848							
453	Poughkeepsie-Hyde Park	Dutchess	7, 10, '06	4.00	16	26-28-32	2,603	Local stone	Sand	Local stone	Same	2		
454	Ithaca	Tompkins	8, 30, '06	3.66	16	24-26-28	3,033	Fieldstone	Sand	Limeston	Same	89		
455	Wyckoff	Tompkins	8, 30, '06	0.34	12	28	Emb. 5,809							
456	Little Falls-East Creek	Herkimer	7, 19, '06	5.39	16	26	4,991	Trap-rock	Sand	Gneiss	Same	41		
457	Little Falls-Herkimer	Herkimer	7, 9, '06	5.32	16	26	5,781	Local stone	Sand	Trap-rock	Same	49		
458	Herkimer-Frankfort	Herkimer	7, 10, '06	3.69	16	26	3,992	Local stone	Sand	Trap-rock	Same	48		

459	East Schuyler–Deerfield	Herkimer	7, 9, '06	5.53	16	26	3,336	Local stone	Sand	Trap-rock	Same	22		
460	Herkimer–Middleville	Herkimer	7, 10, '06	6.30	12, 14, 15 16	24	3,407	Local stone	Sand	Local stone	Same	17		
475	Suspension Br.–Lewiston	Niagara	9, 8, '06	2.42	16	26	5,744	Limestone	Sand	Limestone	Same	91		
476	Ausable Forks–Clintonville	Clinton	8, 31, '06	5.38	14, 22	24	2,721	Local stone	Sand	Local stone	Same	56		
482	Dansville–Mt. Morris, Sec. 3	Livingston.	7, 11, '06	2.23	16	32	3,260	Limestone	Sand	Limestone	Same	100	25,000 00	11,211
483	Catskill Turnpike, Sec. 3	Tompkins.	8, 30, '06	4.44	12, 16	22–26	Emb. 2,860					7		
484	Canandaigua–Victor	Ontario	7, 9, '06	6.79	12	22–32	2,573	Lo'r lo stone.	Sand	Limestone	Same	100	48,875 48	7,198
486	Skaneateles–West Lake, Secs. 3, 4, 5	Onondaga.	11, 10, '06	3.37	12–16	26–30	2,359	Fieldstone	Sand	Limestone	Same	62		
487	Elbridge	Onondaga.	11, 10, '06	3.66	12–16	24–26–32	3,415	Limestone	Sand	Limestone	Same	11		
505	Norwich–North Norwich	Chenango	11, 10, '06	4.60	12–16	20–22–24	2,826	Limestone	Sand	Limestone	Same	73		
506	Chittenango–Eagle Village	Madison	7, 6, '06	2.18	12	20–26–30	5,000	Limestone	Sand	Limestone	Same	92		
507	Transit, Sec. 3	Niagara	7, 9, '06	4.68	16	32	2,628	Limestone	Sand	Limestone	Same	74		
508	Selkirk–Coeymans	Albany	9, 4, '07	4.77	14			Approved st.	Sand	Trap-rock	Same			
509	Oswego–Mexico, Sec. 1	Oswego	7, 6, '06	5.40	11	22, 24, 26	Emb. 2,309	Fieldstone	Sand	Local sand	Limestone	99		
510	Homer–Tully, Sec. 1	Cortland	7, 10, '06	4.17	12	26	Emb. 1,685	Fieldstone	Sand	Limestone	Same	7		
519	Mt. Kisco–Pleasantville	Westchest.	9, 4, '07	3.92	14			Approved st.	Sand	Approved st.	Same			
520	Pleasantville–Pocantico Hills	Westchest.	9, 4, '07	3.55	14			Approved st.	Sand	Approved st.	Same			
521	Massena–Waddington, Secs. 1, 2, 3, 4	St. Law	9, 20, '07	8.62	12	26	2,144							
522	Clarence–Hunt's Corners	Erie	6, 30, '06	4.75	12	22–32	2,408	Limestone	Sand	Limestone	Same	100	39,122 89	8,234
523	Hamburg–No. Collins	Erie	7, 9, '06	8.86	16	16–32	3,799	Limestone	Sand	Limestone	Same	3		
524	North Collins–Lawtons	Erie	9, 17, '07	5.43	16	32	2,871	Limestone	Sand	Limestone	Same	.03		
525	Lawtons–Gowanda	Erie	9, 20, '07	4.00	16	22–32	5,308	Limestone	Sand	Limestone	Same			
526	Collins–Mortons Cor., Sec. 1	Erie	9, 20, '07	4.01	12	32	2,640	Limestone	Sand	Limestone	Same			
527	Hamburg–Springville, Sec. 1	Erie	9, 20, '07	9.47	12	22–32	2,880	Gravel	Gravel	Limestone	Same			
528	Hamburg–Springville, Sec. 2	Erie	9, 20, '07	7.34	12	22–32	3,583	Gravel	Gravel	Limestone	Same			
529	Alden Town Line–Clinton Street, Murilla	Erie	9, 20, '07	6.02	12–16	32	2,355	Limestone	Sand	Limestone	Same			
530	Base Line–Gravel Island, Sec. 1	Erie	9, 20, '07	1.81	16	32	1,143	Limestone	Sand	Limestone	Same			
533	West Chazy–Chazy	Clinton	9, 5, '07	6.34	14			Approved st.	Sand	Approved st.	Same Limesto'e			
534	North East Center–Sharon Sta.	Dutchess	7, 9, '06	3.65	14	22, 24, 30	3,563	Local stone	Sand	Local stone	Same	100	34,344 54	9,409
535	Cortland–Dryden, Sec. 2	Cortland	9, 20, '07	2.70	12	26	1,963							
537	Amenia–Wassaic	Dutchess	7, 7, '06	4.83	14	24–26	2,882	Local stone	Sand	Local stone	Same	74		
540	Chatham–Spencertown	Columbia	7, 6, '06	4.32	14–16	20–24	4,754	Gravel	None	Gravel	None	71		
545	Syosset–Cold Spring Harbor	Nassau	9, 5, '07	3.22	16			Trap-rock	Sand	Trap-rock	Same			
549	Poughkeepsie–Pleasant Valley	Dutchess	7, 5, '06	6.93	14, 16, 20	30	2,538	Local stone	Sand	Local stone	Same	55		
550	Violet Ave.–East Park	Dutchess	8, 28, '06	1.99	14	26	Emb. 2,520	Local stone	Sand	Local stone	Same	100	17,141 18	8,614
551	Fishkill–Hughsonville	Dutchess	7, 10, '06	2.91	14	26	2,611	Local stone	Sand	Local stone	Same	100	26,241 77	9,018
552	Rhinebeck–Elizaville	Dutchess	9, 5, '07	5.54	16			Approved st.	Sand	Approved st.	Same			
559	Utica–Bridgewater	Oneida	9, 19, '07	9.09	12–16	26–30–32	2,858							
560	Mohawk River Road, Rome	Oneida	9, 19, '07	2.42	16	30–32	2,717	Fieldstone	Sand	Gneiss	Limestone			

ROADS FOR WHICH CONTRACTS HAVE BEEN AWARDED UNDER CHAPTER 115, LAWS OF 1898, AND CHAPTER 468, LAWS OF 1906, TO OCTOBER 1, 1907 — (Concluded).

Road number.	NAME OF ROAD.	County.	Date of contract.	Length in miles.	Width of macadam.	Width of roadway.	Cubic yards excavation per mile.	MATERIALS.				Per cent completed.	TOTAL COST COMPLETED.	
								BOTTOM. (Usually 4 inches thick after rolling.)		TOP. (Usually 2 inches thick after rolling.)				
								Kind of crushed rock.	Kind of screenings or sand as filler.	Kind of crushed rock.	Kind of screenings or sand as filler.		Whole.	Per mile.
					Feet.	Feet.								
567	Matteawan-Wiccopee	Dutchess	9, 5, '07	4.71	14-16	....	....	Approved st.	Sand	Trap-rock	Same	....	....	....
569	Baldwin Place-Mahopac	Putnam	7, 11, '06	5.90	14-16	26-28	3,106	Local stone	Sand	Local stone	Same	71	....	....
570	Carmel-Kent	Putnam	9, 5, '07	5.02	14, 16, 22	....	....	Approved st.	Sand	Approved st.	Same	....	....	....
577	Schenectady-Guilderland	Schen'ctd'y	7, 9, '06	7.10	14	26-30	3,670	Local stone	Sand	Local stone	Same	100	$56,704 50	$7,987
586	East Pembroke-Batavia	Genesee	6, 30, '06	5.58	16	22	2,909	Limestone	Sand	Limestone	Same	49	....	....
589	Nevis-Blue Store	Columbia	9, 1, '06	3.81	14	26	2,053	Local stone	Sand	Local stone	Same	43	....	....
590	Auburn-Seneca Falls, Sec. 1	Cayuga	11, 10, '06	7.96	12-16	24-26	Emb. 2,425	Limestone	Sand	Limestone	Same	22	....	....
591	Moravia-Niles	Cayuga	11, 15, '06	10.85	12	22-24	Emb. 2,488	Limestone	Sand	Limestone	Same	30	....	....
592	Auburn-Elbridge	Cayuga	9, 18, '06	5.61	12-16	24-26	Emb. 2,032	Limestone	Sand	Limestone	Same	57	....	....
593	Highland Lake-Tompkins Cove	Rockland	9, 13, '06	5.88	12	22	10,119	Local stone	Sand	Local stone	Same	28	....	....
596	Norwich-South New Berlin, Sec. 1	Chenango	9, 20, '07	3.42	12	24	2,748	....	....	....	....	....	....	....
601	Olean-Allegany	Catt'gus.	9, 24, '07	3.09	16-20	24-30	2,560	Gravel	Gravel	Limestone	Same	....	....	....
606	Cayuga Heights-Hanshaw's Cors	Tompkins	9, 20, '07	2.12	12	24	3,738	....	....	....	....	....	....	....
614	Auburn-Owasco	Cayuga	9, 20, '07	6.08	12	26	1,563	....	....	....	....	....	....	....
615	New Lebanon-Brainard	Columbia	9, 5, '07	8.03	14	....	....	Approved st.	Sand	Approved st.	Same	....	....	....
616	Trumansburg-Ithaca	Tompkins	9, 20, '07	8.66	12	24	2,263	....	....	....	....	....	....	....
617	Lewiston-Dickersonville	Niagara	9, 20, '07	4.80	12	32	2,787	Li. or lo. st.	Sd. or screen.	Limestone	Same	....	....	....
622	Mt. Morris-Geneseo	Livingston.	9, 20, '07	5.20	14	22-32	3,830	Limestone	Sand	Limestone	Same	....	....	....
640	Rotterdam Junction-Pattersonville	Schen'ctd'y	9, 5, '07	3.97	14-16	....	....	Approved st.	Sand	Trap-rock	Same	....	....	....
656	Sandy Hill-Glens Falls	Warren	9, 5, '07	2.12	16	....	....	Approved st.	Sand	Approved st.	Same	....	....	....

REPORT

OF THE

DIVISION ENGINEER

OF THE

EASTERN DIVISION

For the Fiscal Year Ending September 30, 1907.

EASTERN DIVISION.

STATE OF NEW YORK,
DEPARTMENT OF STATE ENGINEER AND SURVEYOR,
EASTERN DIVISION.

ALBANY, *October* 1, 1907.

Hon. FREDERICK SKENE, *State Engineer and Surveyor:*

Sir.— I have the honor to submit herewith my annual report as Division Engineer of the Eastern Division of your Department for the fiscal year ending September 30, 1907.

The chief work of this Division has consisted in performing the necessary engineering work in connection with the present canal system and making surveys, plans and supervising construction of the new Barge canal; also making surveys, plans and supervising improvement of highways under chapter 115, Laws of 1898.

For canal purposes the Eastern Division comprises that part of the canal system of the State extending from the Hudson river at Albany to the east line of Oneida county, and from the junction of the Erie and Champlain canals, about a mile north of Watervliet, to the south end of Lake Champlain, covering a total of 188.36 miles of navigable waters.

For highway improvement purposes there are included in the Eastern Division the counties of Albany, Clinton, Columbia, Delaware, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Herkimer, Montgomery, Nassau, Orange, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington and Westchester, with a total highway mileage of 31,538 miles.

Coöperation has been extended and assistance given to the Department of Public Works in making surveys, plans and estimates whenever it has been requested. Surveys have been made and testimony given on behalf of the State in the Court of Claims in suits brought against the State for damage resulting from leaks and breaks in the canal.

BARGE CANAL.

(Chapter 147, Laws of 1903.)

For the purpose of Barge canal work the Eastern Division has been divided into the following residencies:

Erie canal, Residency No. 1. From the Congress street bridge crossing the Hudson river at Troy to the west end of the lower Mohawk aqueduct at Crescent, including that portion of the Hudson river which is common to the main line of the canal and of the Champlain canal. C. Arthur Poole, Resident Engineer in charge, office at Waterford.

Erie canal, Residency No. 2. From the west end of the lower Mohawk aqueduct at Crescent, to the head of old lock No. 27, situated about three-fourths of a mile west of Cranes Village, Montgomery county. C. Arthur Poole, Resident Engineer in charge, office at Schenectady.

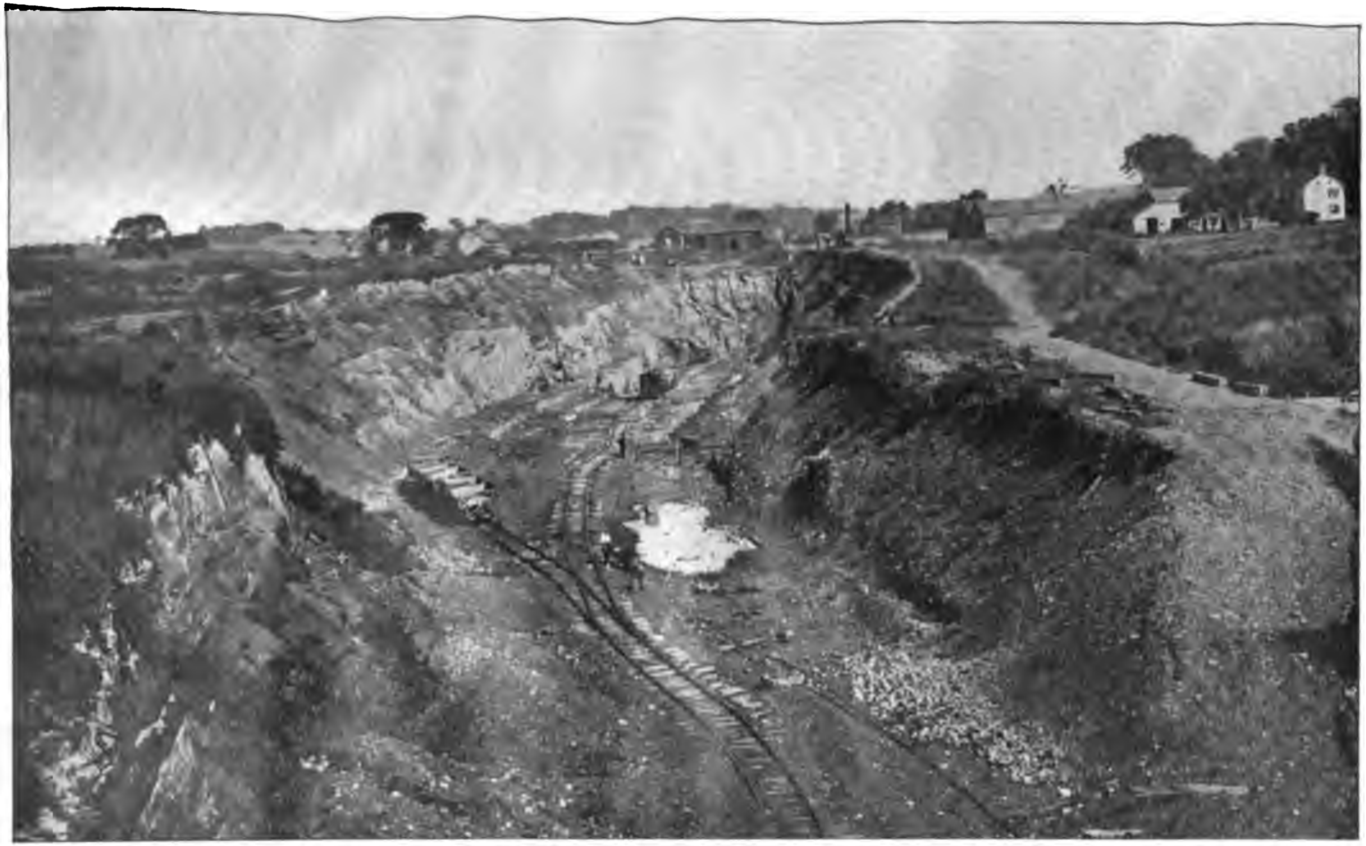
Erie canal, Residency No. 3. From the head of old lock No. 27 to the head of old lock No. 34 at Mindenville, Montgomery county. F. P. Williams, Resident Engineer in charge, office at Amsterdam.

Erie canal, Residency No. 4. From the head of lock No. 34 to the easterly line of Oneida county, which is also the east line of the city of Utica. S. M. Savage, Resident Engineer in charge, office at Little Falls.

Champlain canal, Residency No. 1. From the junction of the Barge canal and Champlain canal, in the Hudson river east of Waterford, to the foot of old lock No. 10, near Northumberland dam, Washington county. E. V. R. Payne, Resident Engineer in charge, office at Mechanicville.

Champlain canal Residency No. 2. From the foot of lock No. 10, near Northumberland dam, Washington county, to the highway crossing the present Champlain canal at Dunham's Basin, Washington county, including the Glens Falls feeder, dam and pond above. E. V. R. Payne, Resident Engineer in charge, office at Fort Edward.

Champlain canal, Residency No. 3. From the highway crossing the present Champlain canal at Dunham's Basin, Washington



Barge Canal, Contract No. 2.
View showing the work of excavating at the site of lock No. 3, near Waterford.

county, to Lake Champlain. E. V. R. Payne, Resident Engineer in charge, office at Fort Edward.

The reports of the several Resident Engineers on the work done during the fiscal year on their respective residencies follow:

Resident Engineer C. Arthur Poole reports concerning Erie residencies Nos. 1 and 2:

ERIE CANAL RESIDENCY NO. 1.

"This residency extends from Congress street bridge at Troy to the west end of the lower Mohawk aqueduct at Crescent. The work has consisted entirely of construction, with the exception of some appropriation surveys in the vicinity of Crescent. No surveys have been made or construction work done on the lower portion of this residency from the Congress street bridge to Waterford, as it has been expected that the United States Government would undertake this portion of the improvement. The portion of the residency between the Hudson river at Waterford and the Mohawk river at dam No. 2, is under construction and is included in contracts Nos. 2 and 11, and bridge contracts Nos. 7 and 34; a report on each of which is given below. The portion of the residency in the Mohawk river is included in contract No. 14, which provides for the construction of dam No. 2, called the "Crescent Dam" and the improvement of the river between that point and the Crescent aqueduct. This contract has been let but no work has been done as yet.

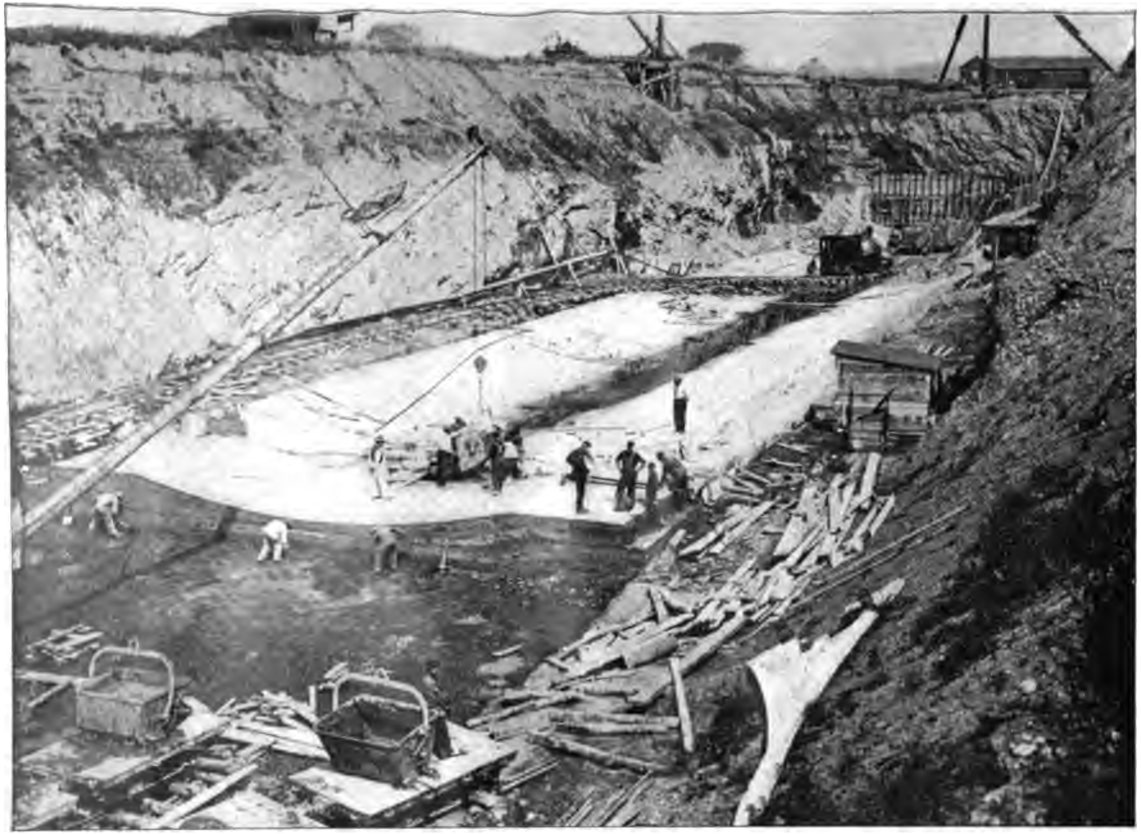
"*Contract No.* 2. The terms of this contract call for its completion on July 1, 1907, but the supplementary agreement — alteration No. 2 — extends the time to November 1, 1908. This extension was granted in view of the delay in signing the contract, the delay in removing the buildings from the site and the delay caused by changing the width of locks from 28 feet to 45 feet. During the past year the progress on this contract was very slow up to August 1, but since that time it has been satisfactory. About 7 per cent of the total amount of excavation has been done during the year, making a total of 57 per cent completed. Most of this excavation was done by dredging in the lower approach to lock No. 2, the material being deposited as embankment back of the south retaining wall between locks Nos. 2 and 3. The excavation for lock No. 3 was completed and about 50 per cent of excavation for the south wall of lock No. 2 was removed and deposited on spoil bank. A small amount of excavation was also done for the by-pass of lock No. 3. Thirteen per cent of the total amount of embankment has been made, which is the total amount completed to date. Most of this embankment was placed back of the south retaining wall between locks Nos. 2 and 3 and a small amount back of the north retaining wall.

"No piles have been driven during the year, the foundation of lock Nos. 2 and 3, where most of this year's work has been done, being on rock.

"Concrete work was continued during the fall of 1906 on the north retaining wall between locks Nos. 2 and 3, until work was stopped for the winter. The back wall, for the south abutment of Saratoga avenue bridge, was completed in January. No more concrete work was done until the first week in June, the contractors in the meantime installing an entirely new concrete plant, using the Hains mixer. The retaining wall between the old Champlain canal crossing and Saratoga avenue, the backwall for the north abutment of Saratoga avenue bridge and the abutments for the Fourth street bridge have been completed since that date. Concrete work was started in lock No. 3 on June 22 and to date 77 per cent of the lock is completed. Lock No. 2 was started September 12, and only a small proportion of the total has been done to date. All concrete on this contract is mixed at a central mixing plant and transported in buckets on flat cars to the site where it is to be used and there handled with derricks.

"The other items of work on the contract completed to date are incorporated in the construction of the locks, the progress depending upon the amount of concrete placed in the locks.

"The following table gives the summary of work done during the year and the total completed to date:



Barge Canal, Contract No. 2.

View of lock No. 3, near Waterford, showing progress in constructing the concrete floor.

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing . . . . acres.	42.5	0	36.6	0	90
Grubbing . . . . cu. yds.	1,200	70	135	6	11
All excavation . . . . cu. yds.	585,000	38,600	336,500	7	57
Sheeting and bracing . . . . ft. B. M.	50,500	10,424	23,600	21	47
Forming embankment . . . . cu. yds.	109,900	14,050	14,050	13	13
Foundation piles, 15 ft. and 20 ft. long . . . . . . No.	2,130	0	1,485	0	70
25 ft. long . . . . No.	100	0	3	0	3
Concrete, second-class . . . . cu. yds.	97,000	20,947.4	28,469.4	22	29
Concrete, third-class . . . . cu. yds.	500	414	414	83	83
Iron castings, plain . . . . lbs.	233,000	103,096	108,234	44	46
Iron castings, machined . . . . lbs.	58,000	19,747	26,422	34	46
Steel castings . . . . lbs.	15,000	3,619.6	3,619.6	24	24
Structural steel . . . . lbs.	156,000	1,939.66	1,939.66	12	12
Fender fastenings . . . . No.	860	57	57	7	7
Additional bailing and draining, Lock No. 2 . .	Lump sum.	10%	10%	10	10
Additional bailing and draining, Lock No. 3 . .	Lump sum.	40%	90%	40	90
Additional form and labor	Lump sum.	20%	20%	20	20
Additional material and labor	Lump sum.	20%	20%	20	20

"*Contract No.* 11. Previous to this year very little work was done on this contract; the only items of work on which much was accomplished were clearing and grubbing, about 20 per cent of the former and 35 per cent of the latter having been completed. The excavation work has progressed satisfactorily during the year. The excavation for lock No. 5 and for core-walls at head of lock, the excavation for the south core-wall of lock No. 4 and about 30 per cent of the north core-wall were completed. A steam shovel was placed in the big cut above lock No. 6 in February and another shovel was started in May. The total excavation for this cut to date is 121,741 cubic yards, which is about 29.3 per cent of the total quantity to be excavated. All material from this cut has been placed in spoil banks. In the excavation for the core-walls of lock No. 4, 177,000 ft. B. M. of lumber was used in sheeting the trenches. Twenty-two per cent of the total amount of embankment has been placed during the year, most of which was placed in the embankments at the head of lock No. 4. A small quantity has been placed at the head of lock No. 6 and some has been used in the highway construction. Piles have been driven for the foundations of the guide-walls between locks Nos. 4 and 5; this completes all the piling on the contract.

"Concrete work was started in lock No. 5 July 2. For the first month a small Ransom mixer was used, until the concrete plant was completed. In this plant they use the Hains mixer, and convey the concrete on belts to the place to be deposited. The unmixed materials are also handled on belts. To date, about 26 per cent of the total concrete in lock No. 5 has been placed.

" Concrete work in the south core-wall of lock No. 4 was started August 26 and has been completed to the ground surface. About 29 per cent of the total quantity has been placed.

" The highway from the foot of lock No. 4 to the head of lock No. 6 has been practically completed during the year.

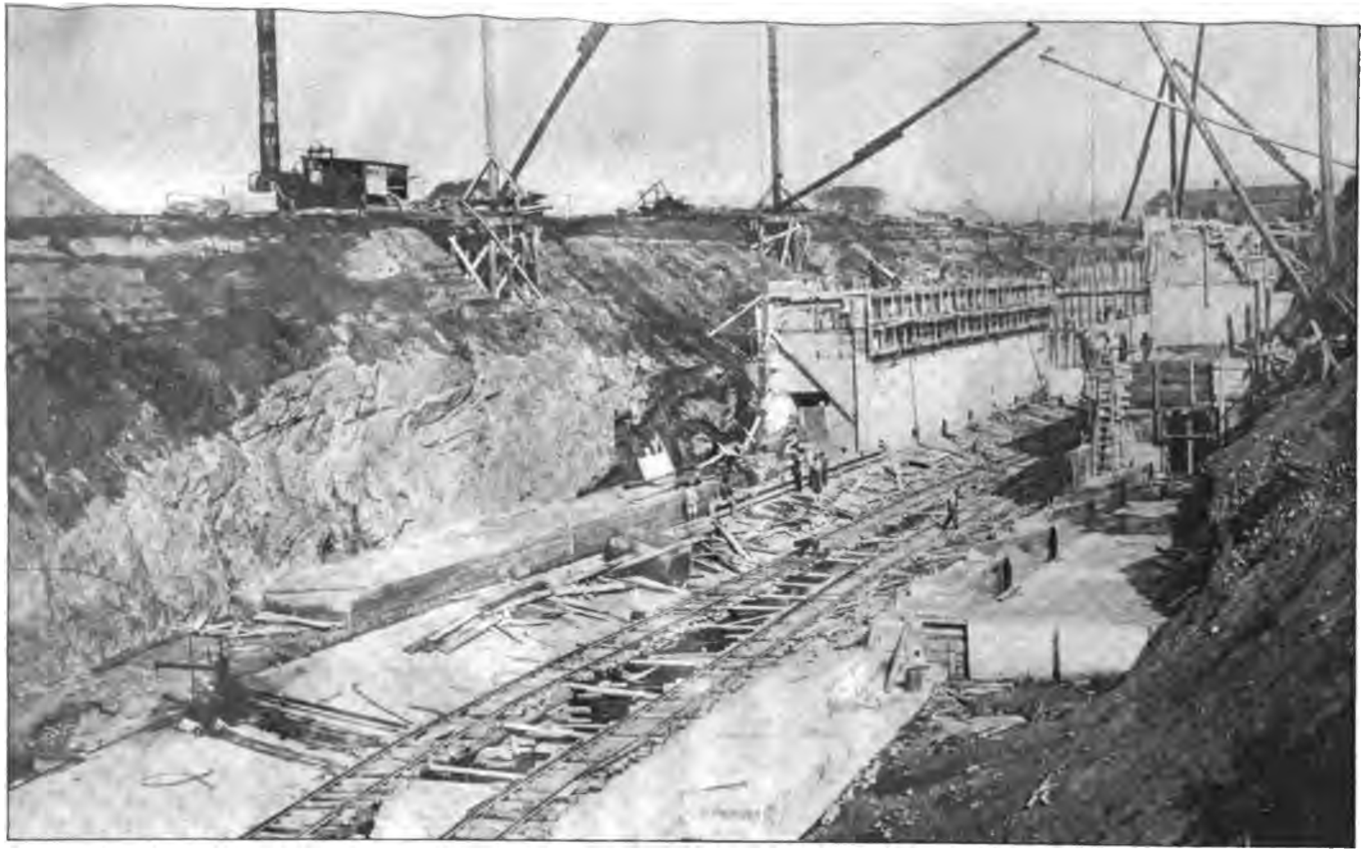
" The other items of work completed are incidental to the construction of the lock and the progress upon them depends upon the rate of progress in the lock.

" The following table gives the summary of work done during the year and the total completed to date:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing	Lump sum.	70%	90%	70	90
Grubbing ....cu. yds.	15,000	2,844	8,094	19	54
All excavation ....cu. yds.	800,000	158,985	166,235	19.8	20.8
Sheeting and bracing ....ft. B. M.	200,000	177,185	177,185	88.6	88.6
Forming embankment, first-class ....cu. yds.	115,000	7,864	11,364	7	10
Forming embankment second-class ....cu. yds.	275,000	39,950	43,250	15	16
Lining ....cu. yds.	6,000	2,243	2,243	37.4	37.4
White oak ....ft. B. M.	14,000	1,410	1,410	10	10
Foundation piles, 15 ft. long ....No.	50	50	50	100	100
Foundation piles 20 ft. long ....No.	300	258	258	Finished.	Finished.
Concrete ....cu. yds.	165,000	10,160	10,160	6.1	6.1
Iron castings, plain ....lbs.	380,000	91,906	91,906	24.2	24.2
Iron castings, machined ....lbs.	90,000	27,984	27,984	31.1	31.1
Structural steel ....lbs.	110,000	2,807	2,807	3	3
Metal reinforcement ....lbs.	450,000	950	950	0.2	0.2

" *Contract No. 7.* This contract provides for the erection of several bridges over the proposed Barge canal in various localities in the State and among the number is the Fourth street bridge at Waterford, which is located on this residency. The contract calls for the furnishing and erecting of the superstructure only. The contractors began erecting the false work for this bridge August 29 and the first steel was placed September 7. To date, all the steel work has been erected and is in place, but no riveting has been done.

" *Contract No. 34.* This contract provides for the furnishing



BARGE CANAL, CONTRACT NO. 2.
View of lock No. 3, near Waterford, showing progress in constructing the concrete floor, side walls and head walls.

and erecting of a highway bridge superstructure over the canal at Saratoga avenue, Waterford. The erection of this bridge has been delayed by various causes and the progress has been very slow. The contract calls for its completion on January 1, 1907, but the abutments were not finished on that date. The contractor started to erect the false work April 18, and the first steel was placed May 13. It was not until the first week in August that the steel was all in place and ready for riveting. To date, about 65 per cent of the riveting has been completed.

"ERIE CANAL RESIDENCY NO. 2.

"This residency extends from the west end of the lower Mohawk aqueduct at Crescent to the head of old lock No. 27 at Cranes Village. During the year the work on this residency has consisted of appropriation surveys in the vicinity of Vischer's Ferry and of construction embraced in contract No. 8, a report upon each of which is given below. The rest of the construction work on this residency is included in contracts Nos. 14 and 20. All the necessary office work, surveys and borings for these contracts were made previous to this year. Contract No. 14 has been let but no work has been done as yet. Contract No. 20 has not been let.

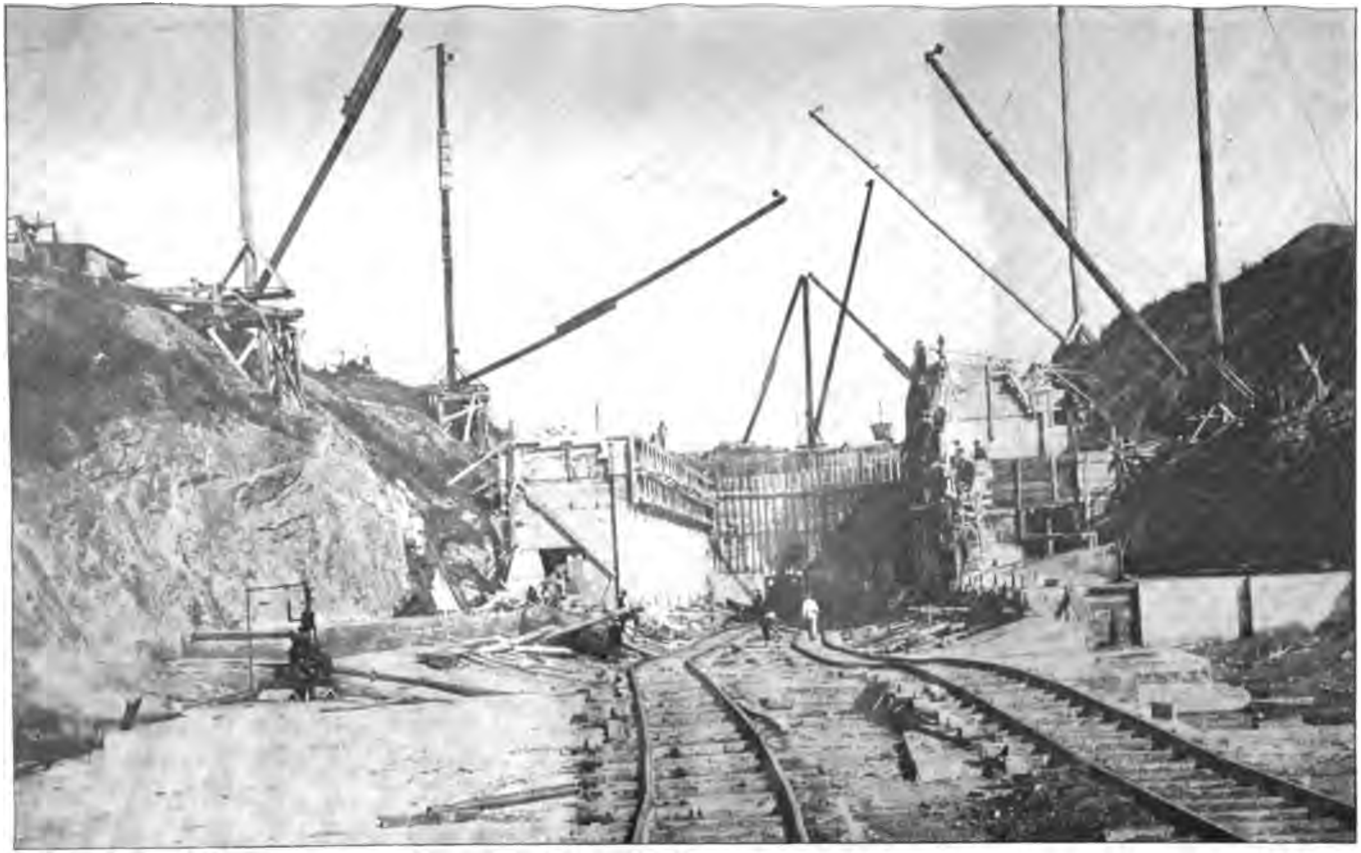
"*Contract No.* 8. Actual construction work on this contract began October 3, 1906, at Cranes Village, when the excavation for lock No. 10 was started. This work was carried on during the fall of 1906, but was discontinued for the winter. A small amount of embankment was done at the upper end of the guide-wall during the fall. Excavation work was taken up again April 11 and was continued until September 3, when the excavation for the lock and guide-walls and a section of the dam, including the south pier, was completed. The shovel was then moved to Rotterdam, where the excavation for lock No. 9 was begun September 25. The excavation at lock No. 10 was placed in spoil banks, except the material used in backfilling for the upper guide-wall. Pile driving was started in the upper guide-wall May 18. The piles are all driven for the upper guide-wall and the land-wall of the lock, also for 80 per cent of the lock floor, 60 per cent of the river wall of the lock, 50 per cent of the apron between the lock and the south pier and for all of the south pier.

"Concrete work was started June 24 and has been continued to date. The upper guide-wall has been completed and the land-wall of the lock between the upper guide-wall and Sta. 1986, with the exception of one 25-foot section. Between Sta. 1986 and 1985+40 the foundation is in place. The concrete is all mixed at a central plant, where Hains mixers are used, and is transported in buckets on flat cars to the work where it is handled with a traveling derrick.

"There have been several alterations on this contract, the principal one permitting the use of gravel for second-class concrete in place of broken stone at a reduced price of 10 cents per yard. The contractors have installed a sand-washing plant on the site of the work and use the sand and gravel from the excavation for the aggregate of the concrete, after it has been thoroughly washed. The other items of work completed to date are incorporated in the construction of the lock, the progress depending upon the rate of progress in the lock. No work has been done at Scotia, lock No. 8, and the excavation has just started at Rotterdam, lock No. 9.

"The following table gives the summary of work done during the year and the total completed to date:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing	1	66⅔%	66⅔%	66⅔	66⅔
Excavation ... cu. yds.	362,540	89,160	89,160	24.6	24.6
Sheeting and bracing ... ft. B. M.	100,000	6.75	6.75	6.7	6.7
Embankment ... cu. yds.	65,000	3,500	3,500	5.4	5.4
Foundation piles, 16 ft. long ... No.	3,300	142	142	4.3	4.3
Foundation piles, 18 ft. long ... No.	4,105	226	226	5.5	5.5
Foundation piles, 20 ft. long ... No.	1,100	4	4	.4	.4
Foundation piles, 25 ft. long ... No.	8,927	2,071	2,071	23.2	23.2
Foundation piles, 30 ft. long ... No.	350	168	168	48.0	48.0
Wooden sheet-piling ... ft. B. M.	441,360	10	10	2.3	2.3
Second-class concrete ... cu. yds.	89,955	5,814	5,814	6.5	6.5
Grouted filling ... cu. yds.	4,200	179	179	4.3	4.3
Iron castings ... lbs.	33,000	4,661	4,661	14.1	14.1
Structural steel ... lbs.	3,550,000	374	374	.01	.01
Metal reinforcement ... lbs.	400,000	6,847	6,847	1.7	1.7
Upper lock-gates ... No.	6	.5%	.5%	.5	.5
Needle-dams ... No.	6	1.2%	1.2%	1.2	1.2
Valve-seat supports ... No.	12	1	1	8.3	8.3



BARGE CANAL, CONTRACT NO. 2.

View of lock No. 3, near Waterford, showing progress in constructing the walls.

"*Contract No.* 14. No construction work has been done upon this contract. Surveys for land to be appropriated have been made in the vicinity of Crescent for the relocation of the Crescent-Middletown highway.

"*Surveys.* A party has been in the field most of the year making surveys for land to be appropriated along the Mohawk river in the territory covered by contract No. 14. Most of the surveys are of land that will be flooded, due to raising the water-surface by the construction of dams Nos. 2 and 3. The maximum flood line and maximum navigable flood line are staked out and located; also the intersecting property lines, buildings and other topography. The locating of the property lines and the descriptions of same have occasioned a considerable amount of work in searching the records in the various county clerks' offices. During the past year the following territory has been covered:

"On the south shore from the Mohawk View Sta. of the N. Y. C. & H. R. R. R., to about one-half mile east of Niskayuna; also from about 4,000 feet below the site of dam No. 3 to about 6,000 feet above same — a total of 360 acres.

"On the north shore from Clute's dry dock, Sta. 585, to the narrows above old lock No. 19, Sta. 737, a total of 610 acres. The following summary shows the surveys made to complete the above: 48.7 miles of circuit; 25.4 miles of property lines run out; 1.4 miles of base line rerun; 10.4 miles of appropriation lines run out; 8.0 miles of check levels run; 6.6 miles of maximum flood line and 10.0 miles of maximum navigable line staked out and located by stadia.

"Very little of this year's work has been plotted, but a considerable portion of last year's surveys have been mapped. Appropriation maps have been completed for the land that is needed for construction purposes on contract No. 14.

"The work upon these residencies has been in charge of the following Resident Engineers: Mr. H. P. Willis, to March 1 and from May 1 to June 1; Mr. T. W. Barrally from March 1 to April 1; Mr. H. W. De Graff from April 1 to May 1; Mr. Edwin Styring, Acting Resident Engineer, from June 1 to July 1 and in charge of the writer from July 1 to date."

ERIE CANAL, RESIDENCY NO. 3.

Resident Engineer F. P. Williams reports:

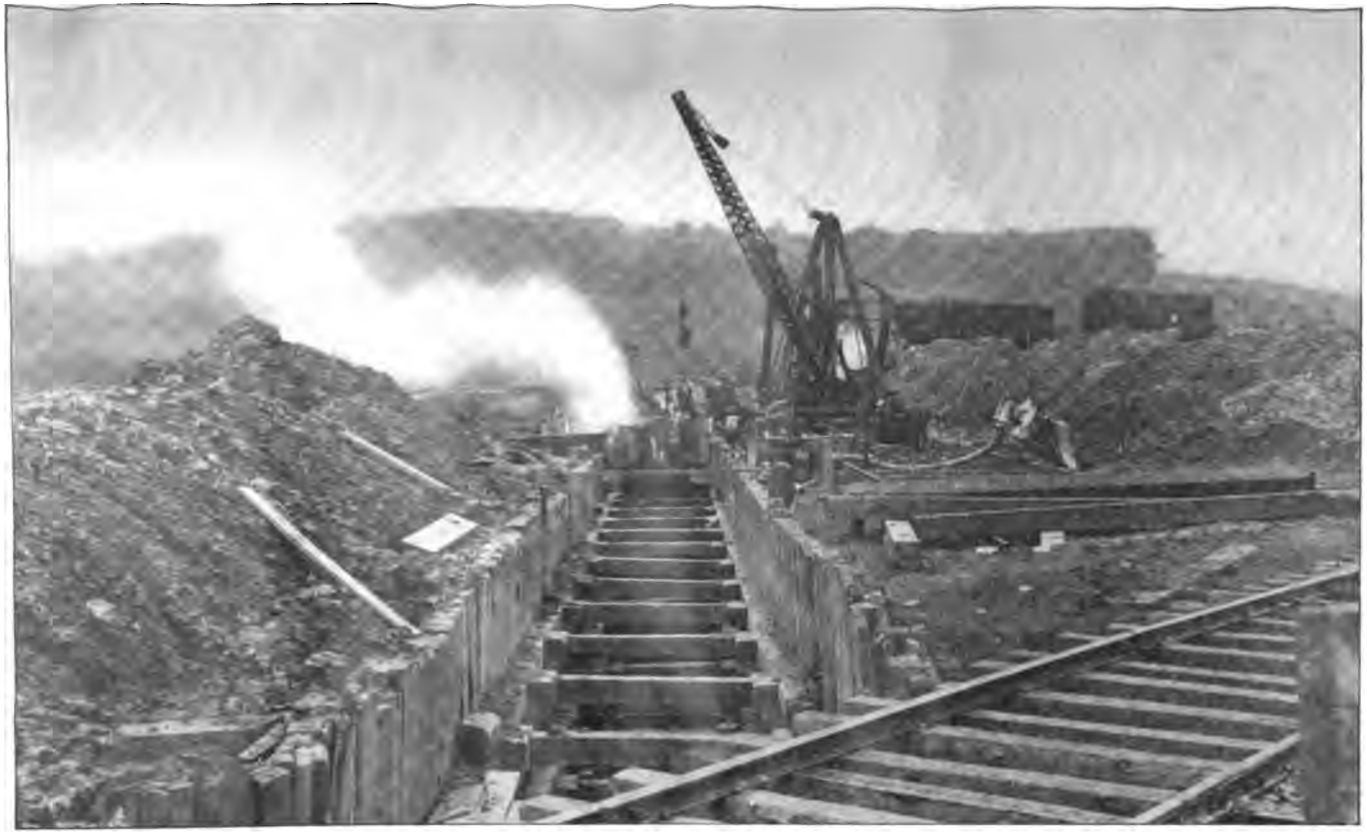
"This residency extends from old lock No. 27 to old lock No. 34 at Mindenville. The following is a report of the work done on this residency for the fiscal year:

"*Surveys.* The surveys for appropriated lands, contract No. 17, at Amsterdam and Tribes Hill, numbering 12 parcels, have been completed. The surveys of appropriated lands for contract No. 14, at Yosts, Canajoharie, Fort Plain and Mindenville, 31 parcels, have been completed. The surveys for construction work, contract No. 17, at Amsterdam and Tribes Hill, have been made as far as the work by the contractors has required.

"*Plans prepared.* The contract tracings of plans have been completed between old lock No. 27, at east end of the residency and St. Johnsville, the west end of the residency, and sent to the Barge canal office, Albany. The contract tracings of cross-sections have been completed between the same limits, with the exception of sheets near dam sites, and sent in. The above covers the work of dredging on this residency and comprises contract No. 28. The length on this residency covers 34.4 miles. The summary sheets of excavation quantities of earth and rock included in contract No. 28, over the entire length of the residency, has been completed and sent to the Albany office. Deed maps with descriptions for contract No. 17 and for contract No. 14, 45 parcels, have been completed and sent to the Albany office. A list of the assessed values and the engineer's estimated value of appropriated lands in the above contracts has been completed.

"SUMMARY OF PLANS COMPLETED.

Contract No.	LOCATION.	Kind.	Sheets.
28........	Old lock No. 27— St. Johnsville	Plans........................	63
		Cross-section sheets..........	93
		Summary of quantities.........	....
17........	Dam No. 7, Amsterdam and Dam No. 8, Tribes Hill	Appropriation maps...........	14
		Index, appropriation maps.....	2
14........	Yosts, Canajoharie, and Ft. Plain, Mindenville	Appropriation maps...........	31
		Index, appropriation maps.....	2



Barge Canal, Contract No. 11.
View of sheeting and bracing in preparation for building one of the core-walls at a lock near Waterford.

"*Construction work.—Contract No.* 17. In February, 1907, the Scofield Company, contractors for contract No. 17, began preparation for the construction of dam No. 7 and lock No. 11, at Amsterdam, and dam No. 8, lock No. 12, at Tribes Hill, comprising that contract. On April 8, 1907, ground was broken on the contract by the commencement of stripping at dam No. 7. The contractors have advanced this work as follows:

"The excavation work for 300 feet of land-wall of lock and upper guide-wall has been carried to grade. The excavation for south span of dam and abutment has been well advanced. The piles for the foundation of abutment have been driven. The excavation for south bank protection has been very largely completed and a small amount of riprap has been placed.

"At dam No. 8, lock No. 12, the construction has been advanced as follows:

"The work of excavating for the foundation of the dam — the abutment and a section 65 feet adjacent — has been practically completed. The excavation for the south bank protection has been largely completed and the laying of riprap well advanced. A small portion of the work of excavating for the lock and its cut-off wall has been completed, the material being used for riprap.

"The contractors, for construction purposes, have built one large coffer-dam at Tribes Hill, dam No. 8, and two large coffer-dams at Amsterdam, dam No. 7, together with two double-tracked construction trestles at that point, in order to carry on the work. The contractor's forces have numbered as high as 400 men in July at dam No. 7, and 100 men at dam No. 8 in September. The financial failure of the contractors became known September 24, 1907. The work continued as usual to the close of the fiscal year.

"The following shows a summary of the work done on this contract during the year:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing	Lump sum.	80%	80%	80	80
Excavation.....cu. yds.	185,000	39,034	39,034	21	21
Forming embankment.....cu. yds.	33,000	306	306	0.9	0.9
Foundation piles, 15 ft. long.....No.	360	33	33	9	9
Foundation piles, 16 ft. long.....No.	1,100	50	50	4.5	4.5
Foundation piles, 20 ft. long.....No.	500	170	170	34	34
Steel sheet-piling.....sq. ft.	700	573	573	82	82
Riprap, hand laid.....cu. yds.	4,200	736	736	17.5	17.5
Riprap, second-class.....cu. yds.	5,300	694	694	13.1	13.1
Riprap, fourth-class.....cu. yds.	4,200	506	506	12	12

"*Contract No.* 14, comprising three locks and dams in this residency, has been let, but no construction work has been commenced.

"The residency office was moved March 25, from Fonda to the Old Guy Park House at Amsterdam, appropriated by the State for construction work at dam No. 7. A small office and force of State men was established during April, 1907, at Fort Hunter, for the purpose of directing construction work of dam No. 8 at that point."

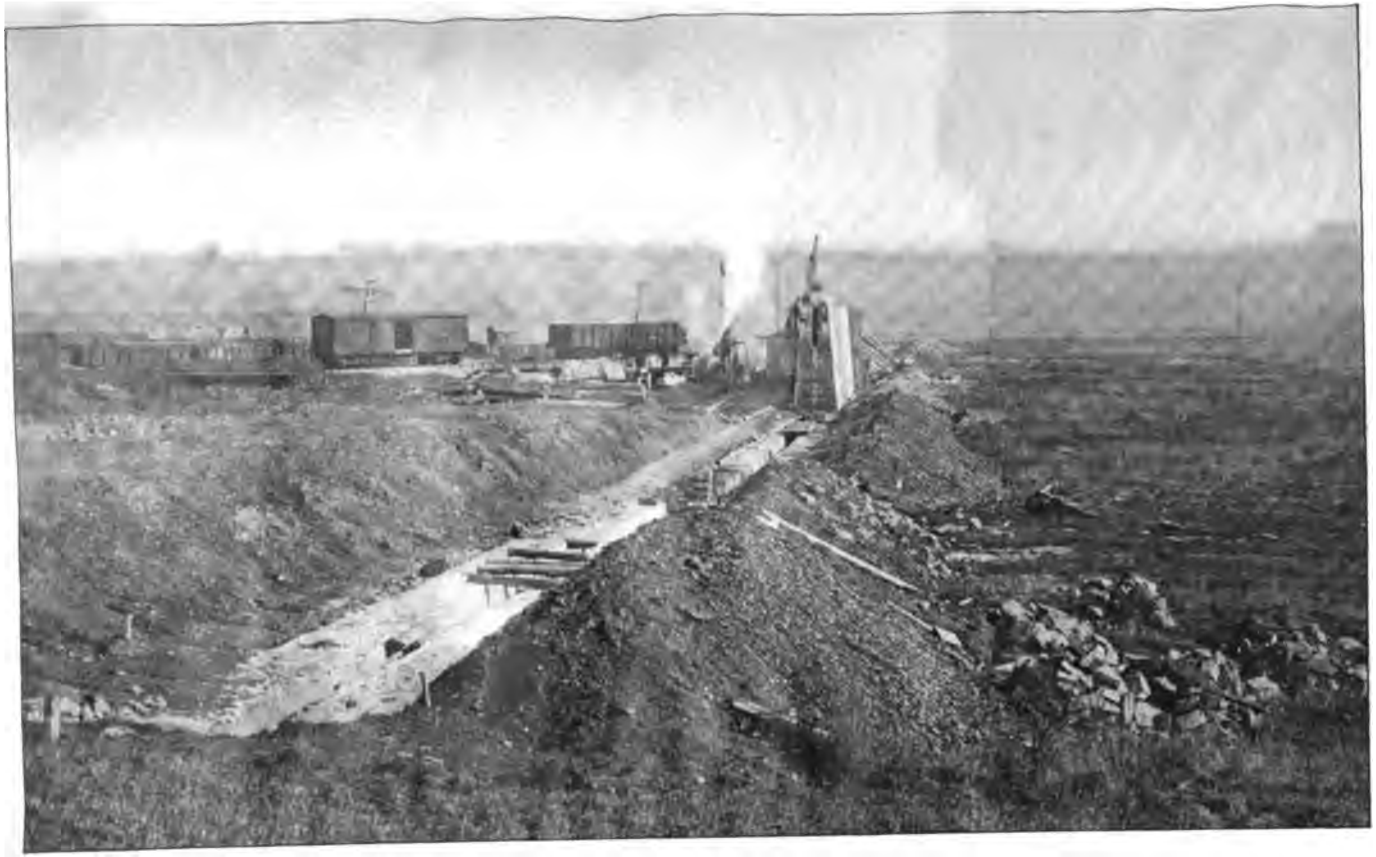
ERIE CANAL, RESIDENCY NO. 4.

Resident Engineer S. M. Savage reports:

"Residency No. 4 extends from a point 2,400 feet east of lock No. 34 of the present canal, at Mindenville, Montgomery county, to the line between Herkimer and Oneida counties, at the easterly corporation line of the city of Utica. The total length of the Barge canal within the residency is 28 miles.

"For purposes of construction the work has been divided into five parts, under contracts Nos. 18, 29, 30, 31 and 32.

"*Contract No.* 18. This contract provides for the construction of lock No. 16 at Mindenville, a guard-gate at Indian Castle, 3.63 miles of standard land line and a temporary canal. The contract was let December 28, 1906, to the O'Brien & Hoolihan Contracting Company of Syracuse, N. Y.



BARGE CANAL, CONTRACT No. 11.
View showing progress in the construction of a core-wall.

" The contractors began work January 31, 1907, by clearing at the site of the lock. On February 7, 1907, the excavation was started for the temporary canal, which replaces that part of the old canal required for the construction of the new lock, located about one-half mile east of lock No. 34, of the present canal. The temporary canal was finished April 24, 1907. The excavation amounted to 37,400 cubic yards, and the embankment to 3,900 cubic yards. Excavation at the site of the new lock (No. 16) was begun May 14, 1907, and the steam shovel finished its excavation September 18, 1907.

" The construction of lock No. 16 was begun at the westerly end of the south upper guard-wall on July 27, 1907, and has been continued to the date of this report. Approximately 3,000 cubic yards of concrete have been placed to date, principally in the upper guide-walls.

" In order to prevent a break in the bank between the temporary canal and the pit excavated for lock No. 16, 400 linear feet of 20-foot steel sheet-piling have been driven parallel to and near the northerly edge of the temporary canal.

" There has been no serious accident on the work, and, although the progress of the work has not been as rapid as could be desired, it has moved along steadily since the beginning.

" The basis of award of this contract was $859,460 and the total value of work done to date is $76,430.

"An office has been established at Mindenville and an engineering party is located there.

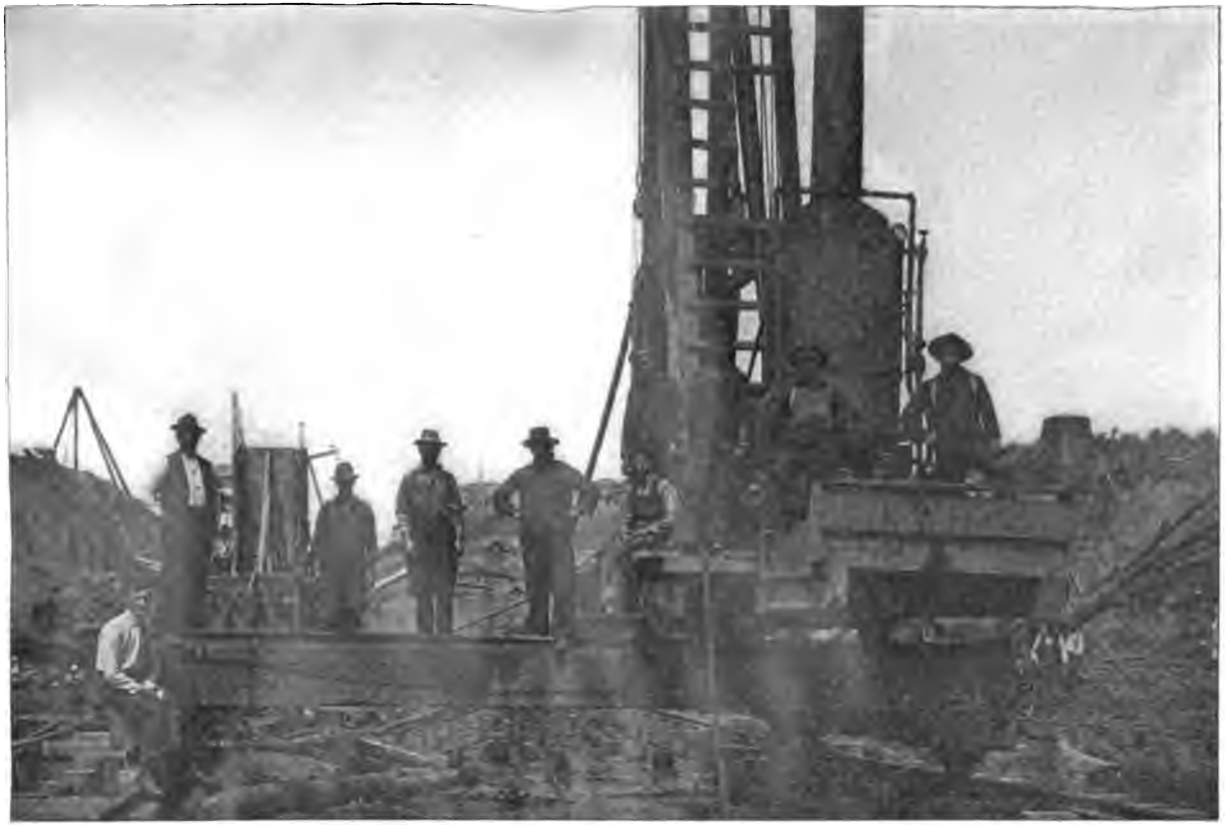
" Mr. George I. Oakley, Assistant Engineer, has been in charge of the work under this contract and has given the State excellent service.

" The following is a summary of the work under this contract:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing.......lump sum.	$500	$125	$125	25	25
Grubbing.......cu. yds.	26,000	1,429	1,429	5.5	5.5
All excavation.......cu. yds.	937,000	98,438	98,438	10.5	10.5
Forming embankment.......cu. yds.	500,000	34,844	34,844	7	7
Lining.......cu. yds.	2,000	....	....	....	....
Sawed lumber.......ft. B. M.	15,000	....	....	....	....
White oak in miter sills.......ft. B. M.	2,000	....	....	....	....
Sheeting and bracing.......ft. B. M.	10,000	969	969	10	10
Foundation piles, 13 ft. long.......No.	120	108	108	90	90
Foundation piles, 20 ft. long.......No.	140	....	....	....	....
Second-class concrete.......cu. yds.	30,000	2,957	2,957	10	10
Reinforced concrete.......cu. yds.	500	....	....	....	....
Grouted filling.......cu. yds.	950	....	....	....	....
First-class masonry coping.......cu. yds.	5	....	....	....	....
Wash-wall.......cu. yds.	30,000	....	....	....	....
Cobble stone paving.......sq. yds.	50	....	....	....	....
Ballast.......cu. yds.	100	....	....	....	....
Third-class riprap.......cu. yds.	150	....	....	....	....
Fourth-class riprap.......cu. yds.	2,500	....	....	....	....
Structural steel.......lbs.	24,000	1,546	1,546	13	13
Metal reinforcement.......lbs.	173,500	....	....	....	....
Cast iron pipe, laid.......lbs.	343,000	....	....	....	....
Steel castings.......lbs.	4,000	....	....	....	....
Iron castings, plain.......lbs.	16,500	3,172	3,172	19	19
Iron castings, machined.......lbs.	9,000	....	....	....	....
Wooden fencing.......lin. ft.	3,500	....	....	....	....
Upper lock-gates.......No.	2	....	....	....	....
Lower lock-gates.......No.	2	....	....	....	....
Upper needle-dam.......No.	1	....	....	....	....
Lower needle-dam.......No.	1	....	....	....	....
Lock-valves.......No.	4	....	....	....	....
Removal of bridge superstructures.......No.	11	....	....	....	....
Maintaining traffic.......	$2,000	....	....	....	....
Will give for buildings on lands appropriated.......	$3,000	....	....	....	....
Alteration No. 1.					
All excavation.......cu. yds.	....	110	110	60	60
Second-class concrete.......cu. yds.	....	60	60	40	40
Extra work.					
Lining temporary canal.......cu. yds.	....	252	252	100	100
Steel sheet-piling, 20 ft. long.......sq. ft.	....	8,000	8,000	100	100
Preparation of 200 sand bags.......	....	$32.50	$32.50	100	100

"*Contract No.* 29 provides for the construction of lock No. 17, a guard-gate, and 1.15 miles of land line through the city of Little Falls. The surveys and plans preliminary to the contract plans were sent to Albany early in April. Blue-line and appropriation surveys for this contract have been in progress for two months.

"*Contract No.* 30 provides for all the dredging on this residency, which is in three sections — Indian Castle to Little Falls, Little Falls to Jacksonburg and Herkimer to Frankfort — for the land line from Frankfort to Oneida county line, for constructing lock No. 19 at Sterling creek, the movable dam at Herkimer, and the necessary protection at stream-entrances. Plans and estimates for the river route, under this contract, were



BARGE CANAL, CONTRACT No. 8.
View at Cranesville, showing progress in driving piles for the approach-walls to lock No. 10.

sent to Albany December 12, 1906. It was decided to change from river section to land line at Frankfort and a new survey of seven miles was made during the summer. Plans and cross-sections were sent to Albany on August 1, 1907. The borings for the change were begun August 5, and are in progress at the date of this report.

"*Contract No.* 31 provides for the construction of lock No. 18 at Jacksonburg, a guard-gate at Herkimer and 4.2 miles of standard land line. The surveys and plans preliminary to the contract plans were sent to the Albany office April, 1907. The blue line and appropriation surveys for this contract have been in progress for two months.

"*Contract No.* 32 provides for iron and steel construction on the whole residency.

"TABULAR STATEMENT OF PRELIMINARY WORK.

ITEM.	Reported to Sept., 1906.	Sept. 30, 1906, to Sept. 30, 1907.	Total to date of report.
Transit line..........miles.	157	7	164
Levels (including cross-sections)..........miles.	203	11	214
Borings (wash drill and drive rod)..........lin. ft.	17,127	5,898	23,025
Borings (Calyx drill and test pits)..........lin. ft.	....	420	420
Topography..........sq. miles.	2	1	3
White paper plans, 1 inch=100 feet..........sq. miles.	26	7	33
Cross-sections..........sq. miles.	30	7	37
Contract tracings..........sq. miles.	11	11	22
Estimates, preliminary..........sq. miles.	26	2	28
Estimates, contract..........sq. miles	11	11	22
Appropriation surveys..........sq. miles	....	6	6
Appropriation plans..........sq. miles	....	4	4
Blue-line surveys..........sq. miles	....	7	7

"All the plans required of this office, preliminary to the letting of the contracts have been finished, except those which may be made necessary by future changes of the line."

Resident Engineer E. V. R. Payne reports concerning Champlain residencies Nos. 1, 2 and 3:

"CHAMPLAIN CANAL, RESIDENCY NO. 1.

"The work of making the preliminary surveys on this section was started in May, 1904, the work at that time being carried on for a period of about two weeks. More work was done during June and July of 1905.

"On October 22, 1906, an office was established at Mechanicville, and preparation was at once made to carry on to completion at as early a date as possible, the preliminary work started in 1904. The net results of this preliminary work, done prior to October, 1907, were the field notes of a topographic survey extending south from Northumberland for a distance of about five miles to Coveville, and covering the territory immediately adjacent to the banks of the Hudson river, and a piece of measured base line extending southerly from Northumberland for a distance of 8.3 miles to a point about a mile north of Wilbur's Basin.

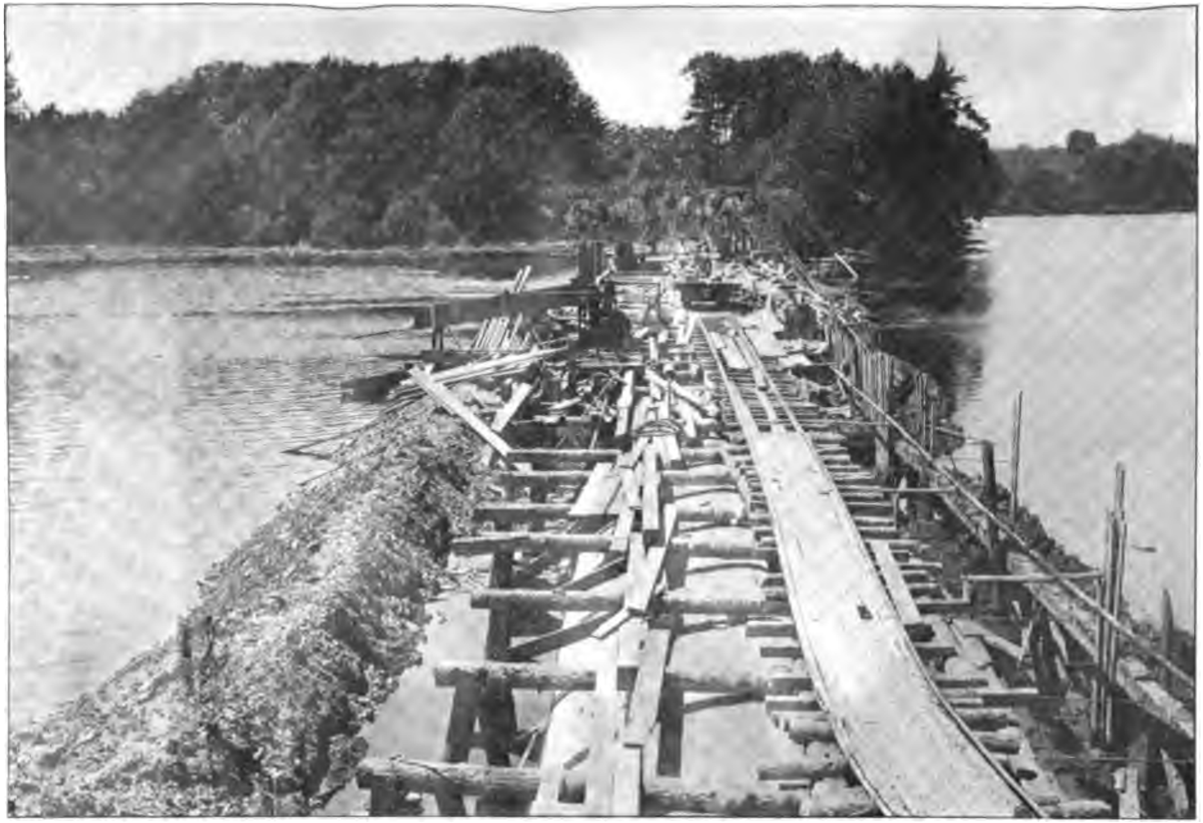
"*Field Work.*

"*Base line.* Prior to October 22, 1906, a measured base line had been run out from lock No. 10 at Northumberland southerly to a point about a mile north of Wilbur's Basin, at which point work was resumed on the above date. The party completed the survey of the base line from Wilbur's Basin to Waterford, a distance of 19.14 miles, in twenty-one working days.

"*Base line monuments.* Each of the angle points in the base line has been permanently marked by replacing the hub with a concrete monument. These monuments are 3 feet 6 inches in length, 9 inches in diameter, and reinforced through the center with a piece of iron pipe of about one inch in diameter.

"*Levels.* Bench levels were run over the line of base line monuments, establishing a permanent bench mark on each of the monuments. These levels were run in circuits beginning and ending on a known canal bench mark from the levels of 1900 and 1901.

"*River soundings.* On December 29, 1906, an attempt was made to sound the Hudson river through the ice, starting just north of Schuylerville, but the rain and warm weather of the 30th carried out the ice, and nothing more was done until February 1, 1907. At that time a party was organized, consisting of about 24 men, and it was the earnest endeavor to rush the work through with all possible speed. The ice on February 1 ranged in thickness from 4 to 10 inches in the neighborhood of Schuylerville, although later, in March, in the vicinity of the B. & M. R. R. bridge,



BARGE CANAL, CONTRACT NO. 1.
View showing progress in the construction of the eastern section of Crocker's Reef dam.

at Mechanicville, ice 30 inches in thickness was encountered. The rifts and places in the river where the current was swift did not freeze during the winter of 1906–07, and such places were sounded from boat during the summer of 1907.

"*Drive rod, or rock soundings.* Where the river was found above the proposed grade, drive rod or rock soundings were made — three on every second range, one at the center line and one 100 feet each side of it. When this work was done through the ice the party consisted of a foreman of borings and three laborers. The holes already bored by the sounding party were used, and the party followed up the sounding party. The drive rod soundings made during the summer of 1907 were made from a catamaran, formed by lashing together two flat bottomed row boats. The catamaran carried a large wooden horse which permitted the use of rods 18 to 20 feet in length.

"*Stadia surveys.* Prior to October 22, 1907, a stadia survey had been made, covering the territory between the Champlain canal and the Hudson river, at Northumberland, and extending southerly from Northumberland, covering both banks of the Hudson to Coveville. Since that date this survey has been extended to include the east bank of the Hudson opposite Northumberland. This survey covers the site of the proposed lock at Northumberland. Stadia surveys have also been made at the site of the proposed lock at Stillwater, at the upper and lower sites at Mechanicville, and also a survey covering the site of proposed lock and dam north of Waterford.

"*Borings.* The test borings at the site of the proposed lock at Northumberland, and those at the proposed site at Stillwater, have been completed. Borings at the remaining sites have not yet been completed.

"*Office Work.*

"*Mounted map sheets.* The base line was plotted, by coördinates, on mounted map sheets, on a scale of 100 feet to the inch. Upon these sheets have also been plotted the stadia surveys and all the river soundings. From the information thus plotted, contours at intervals of two feet, have been developed.

"*50-foot scale maps.* Maps of the lock sites on a scale of 50 feet to the inch have been prepared, or are in course of preparation.

These maps cover the sites at Northumberland, Stillwater, two at Mechanicville and one at Waterford, but embrace only that part of each site immediately adjacent to the proposed structure.

"*Profile and cross-sections.* The profile of the center line has been plotted from Northumberland to Stillwater. On this profile are shown the penetration of the drive rod soundings and the character of the material penetrated.

"Cross-sections of the river bed, and also of the 'Land line' have been plotted. These cross-sections extend about 150 feet either side of the center line, and also show the result of the drive rod soundings.

"*Dredging maps.* Tracings of the 100-foot scale maps have been made from Northumberland to Stillwater. These tracings, known as the dredging maps, have been made to embrace 3,000 feet of the center line on each sheet. On the plan is shown the center line of the proposed canal, the shore line of the river, the profile of the center line and typical sections.

"In conclusion it may be noted that the preliminary field work is now about 95 per cent. completed and that the office work is about 70 per cent. completed.

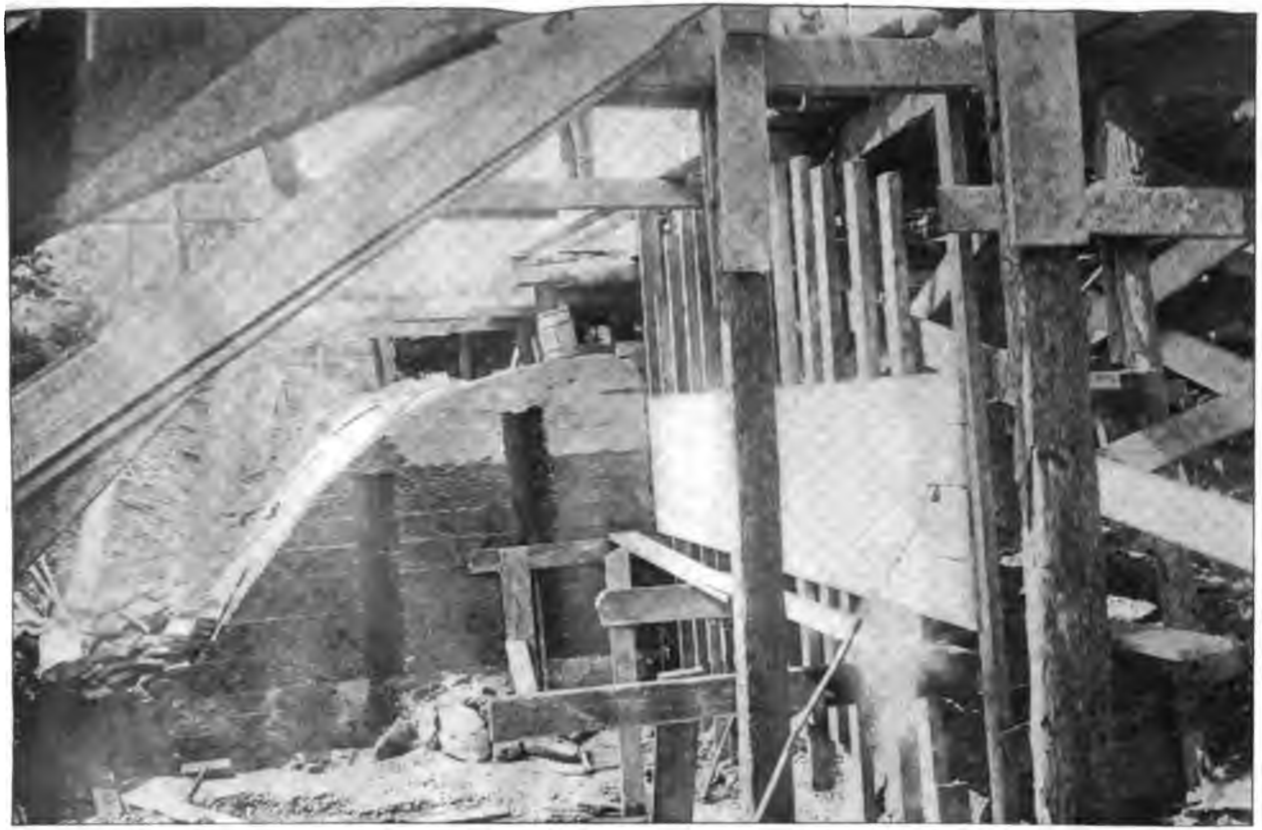
"CHAMPLAIN CANAL, RESIDENCY No. 2.

"*Contract No.* 1. For dredging a channel in the Hudson river from Northumberland, Station 9+52, to Fort Miller, Station 147+75, and from Crocker's Reef, Station 262, to Fort Edward, Station 497+35; the construction of Crocker's Reef dam, the approaches to the head and foot of the 'Land line' and other incidental work.

"The work on Contract No. 1 during the year has consisted in finishing the construction of the Crocker's Reef dam and core-walls, dredging the 'Land line,' at Crocker's Reef, and the river channel from this land line to the north end of the contract. No work has been done on the lower part of this contract from Station 9+52 to 147+75.

"The Crocker's Reef dam was begun June 5, 1906, and on the 22d of November, 1906, the east abutment wall of the east spillway was finished, thus completing the work.

"Two dipper dredges of 3⅓ cubic yards capacity have been



Barge Canal, Contract No. 1.
View showing progress in constructing a concrete dam at Crocker's Reef.

working 24 hours daily continuously during the year, with the exception of the months of December, January, February and March, removing practically all of the material in the prism, with the exception of rock. This material has been hauled in scows by tugs to the spoil area (provided for in original contract and alteration No. 1) north of Crocker's Reef dam. After September 17, one dredge was moved to the north end of the contract and began excavating material, which was placed on the Lawlor spoil bank by the unloading plant, consisting of Hulett and orange-peel buckets and car plant.

"A Lobnitz rock-breaker plant has been operating on the rock sections of the upper end of contract. This machine broke the rock after it was stripped by the dredges. About 4,300 cubic yards of Hudson river shale in the river bottom has been broken and removed. On September 1 it was estimated that the amount of rock which had been drilled by this machine was 27,875 cubic yards, and that 75 per cent of this, or 20,880 cubic yards had been broken sufficiently to dredge. From September 1 to 30, 4,600 cubic yards have been broken, making a total of 25,480 cubic yards of rock broken, or 41.3 per cent of the rock in prism north of Crocker's Reef, and 23.3 per cent of the entire rock to be excavated on the contract.

" In dredging the 'Land line' considerable material was piled by the dredges on either side, and during the year this material has been handled by scrapers and the west embankment built with it. No work on the wash-wall on this embankment has been attempted.

"After the 'Land line' cut was made the construction of the round timber crib was begun at this point on June 24, 1907, and continued until completed —August 9, when it was towed to its present position in the river at the upper end of cut and sunk on August 21. The contractor then started to load the pockets with stone, and at this date, September 30, they are mostly filled. This crib is the foundation for the concrete breakwater, which is 524 feet long and which serves as a guide for boats from the north entering the Land line' cut from the river channel.

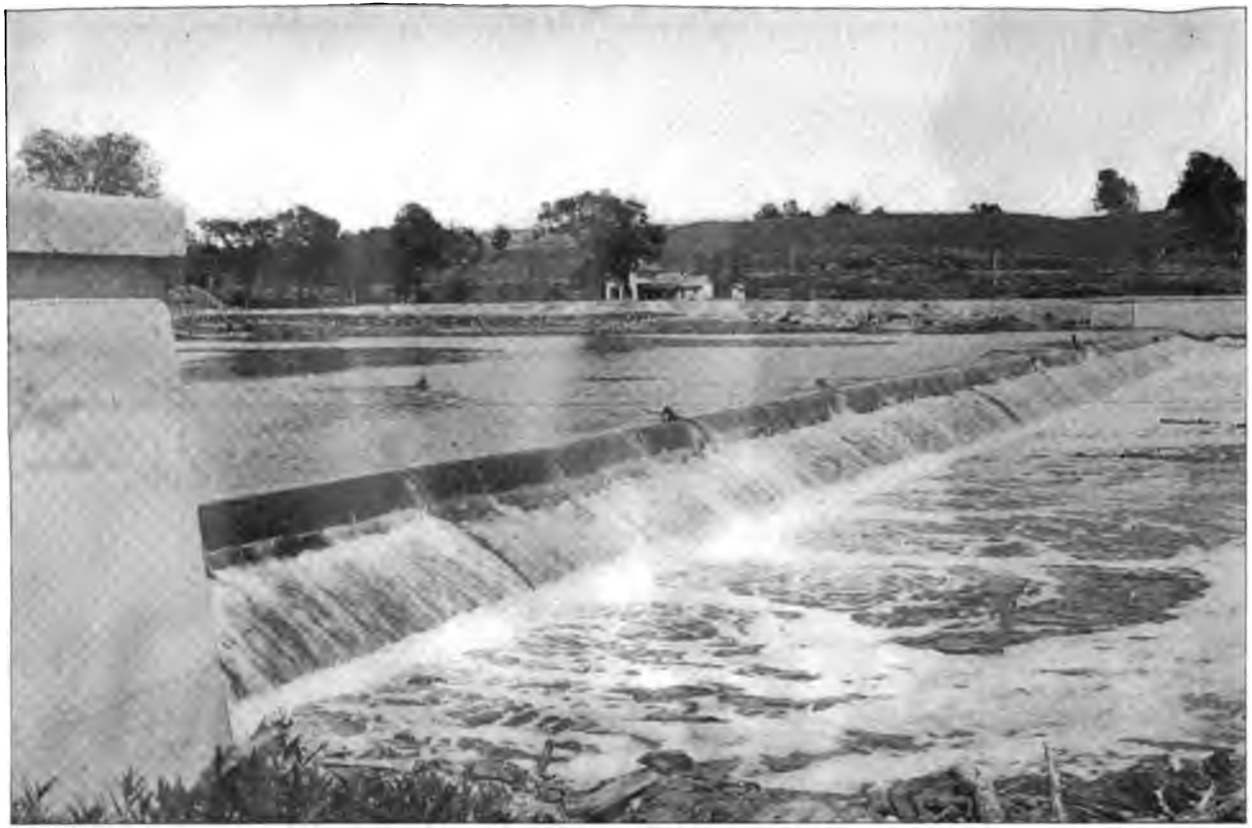
" The following is a summary of the items on Contract No. 1, as they stand on September 30, 1907:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing..........acres.	19.34	0.263	8.703	1.5	45
Grubbing..........cu. yds.	2,242	309	1,337	13.8	59.6
All excavation..........cu. yds.	766,800	384,810	432,071	50.2	56.3
Forming embankment..........cu. yds.	24,147	9,750	11,471.6	40.4	47.5
Yellow pine timber, sawed..........ft. B. M.	84,733	23,307	23,307	27.4	27.6
Round timber..........ft. B. M.	65,056	38,857	38,857	59.7	59.7
First-class concrete..........cu. yds.	920	158.1	828	17.2	90.0
Second-class concrete..........cu. yds.	3,842	339.6	2,414.6	8.8	62.8
Third-class concrete..........cu. yds.	288	331.3	331.3	100.0+	100.0+
Stone filling..........cu. yds.	7,575	2,837.3	2,837.3	37.4	37.4

" *Contract No.* 3. For excavating the canal and protecting its sides from Station 147+75, below lock No. 6 at Fort Miller, to Station 262, above the guard-gate at Crocker's Reef; the construction of lock No. 6 and approaches, the guard-gate and approaches, the bridge abutments and foundations at Stations 151+60, 173+18, 213+46 and 247+50; the removal and reërection of the present bridge at East street; the change in location of the old Champlain canal and all incidental work.

" The excavation of the canal prism was begun in April, 1905, and with the exception of a small amount handled by teams and a grader, and the work at the bottom of lock pit, at Fort Miller, the excavation has been done by three steam shovels, with a car plant. The material has been spoiled on the east side, between the Barge canal and the present canal.

" The major part of the excavation of canal prism is completed. There still remains to be excavated between Stations 200 and 210, about 17,000 cubic yards, and between Stations 220 and 230, 20,000 cubic yards, all of which can be done by steam shovels. Two steam shovels are now excavating these sections and may complete them during the present season. The balance of the excavation yet to be done is on the slopes and in the bottom, and is not suitable for steam shovel work. The kind of material excavated at the south end of the contract and in lock No. 6 has been Hudson river shale of a very tough character. From Fort Miller north, rock is generally found a few feet above grade, overlying which there are



BARGE CANAL, CONTRACT NO. 1.
View showing completed eastern section of Crocker's Reef dam.

various kinds of clay and loam, excepting between Stations 198 to 202 and 221 to 226, where the rock dips abruptly, forming a basin which is filled with a soft mud. Steam shovel excavation was continued until the middle of December, 1906, and was resumed the first of May, and has continued, three shifts working daily to date. The excavation for guard-gate approach wall and lock No. 6 foundation was made during the winter.

" With the exception of the points mentioned above, the banks are standing on a one to two slope, and when the wash-wall is placed on them they will remain in good shape, but at the two sections mentioned, for a space about 600 feet long, special bank protection, other than that provided by the present plans, will have to be made.

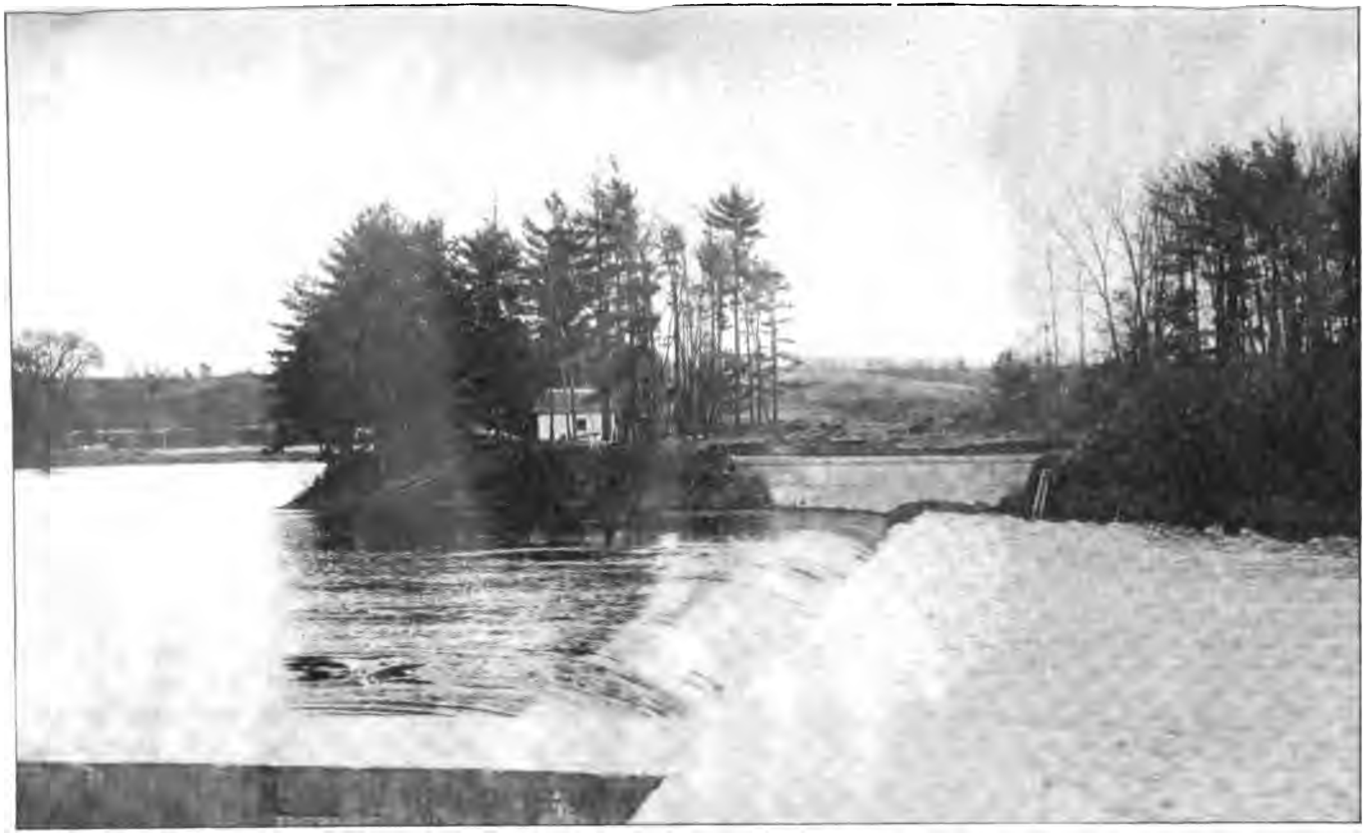
" The prism embankments have been formed roughly to grade, but will require considerable trimming to receive the wash-wall protection. The embankment between the north approach wall to guard-gate, at Crocker's Reef, and the river has been made, but no embankment back of lock No. 6 chamber or approach walls has been formed. The approaches for Payne's bridge, as well as the west approach to Ridge street bridge, have been completed.

"Concrete abutments for three bridges, namely, Payne's, Ridge street and the Fort Miller bridge, were completed in July, 1907. The north approach wall to guard-gate on west side of canal was constructed during the fall and winter of this year. Of the work on lock No. 6, at Fort Miller, the south approach walls, lock chamber floor, gate and miter-sills and about one-third of the lock walls are completed.

" The concrete for the lock and approach walls is mixed by a plant located on the east side of the present lock. Materials are delivered in canal-boats — the stone from Northumberland, the sand from a bank near Sandy Hill. The boats used have a hopper-shaped hold, under which is a rubber belt conveyor operated by an electric motor. From the conveyor in the boat a marine leg receives the materials and lifts them to the storage bins in the top of the mixing plant. From these bins the materials are delivered to the measuring hoppers by gravity and by rubber belt conveyors, and the cement is carried by rubber belt conveyor from the cement house to the measuring hoppers. The concrete is delivered in buckets on cars from the mixers to the derricks which place it in position. A feature of the concrete construction in the lock is the timber bracing crib, which is so constructed as to carry a 30-foot section of the face forms for the two opposite sections of the lock walls the full height of same without taking the forms apart. This crib is mounted on trucks, which run on tracks on the concrete floor of lock. When one section of the wall is completed, the trench braces attached to the forms and held in place by the crib are loosened, and the form moved to an adjoining section, which can be lined up and ready to fill again in 24 hours.

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing .... lump sum.	All	20%	All	20	100
Grubbing .... cu. yds.	8,409	20	6,984	0.23	83
All excavation (inside original lines) .... cu. yds.	843,170	199,975	705,158	23.7	83.7
Forming embankment .... cu. yds.	115,521	23,373	87,599	20.2	75.8
Lining .... cu. yds.	5,300	2,552	2,888	48.1	54.5
Puddle .... cu. yds.	900	0	734	0	81.5
Yellow pine timber and plank .... ft. B. M.	50,000	2,894	21,602	5.8	43.2
Yellow pine timber in stop logs .... ft. B. M.	0	0	0	0	0
White oak timber in miter-sills .... ft. B. M.	3,000	0	0	0	0
Hemlock timber and plank .... ft. B. M.	11,000	0	9,179	0	83.4
Round timber in cribs .... lin. ft.	0	0	0	0	0
Foundation piles, 15 ft. long .... No.	8	0	8	0	100
Foundation piles, 20 ft. long .... No.	4	0	4	0	100
Foundation piles, 25 ft. long .... No.	4	0	4	0	100
Mooring piles, 15 ft. long .... No.	12	0	0	0	0
Mooring piles, 25 ft. long .... No.	0	0	0	0	0
First-class concrete .... cu. yds.	0	0	0	0	0
Second-class concrete .... cu. yds.	38,632	19,550	21,172	50.6	54.8
Third-class concrete .... cu. yds.	450	378	378	83.9	83.9
First-class masonry .... cu. yds.	10	0	0	0	0
Wash-wall, including coping .... cu. yds.	28,461	0	178	0	0.63
Stone filling in cribs .... cu. yds.	0	0	0	0	0
First-class riprap .... cu. yds.	1,600	0	0	0	0
Iron castings .... lbs.	173,350	75,539	75,539	43.6	43.6
Steel castings .... lbs.	5,000	246	246	4.9	4.9
Structural steel .... lbs.	75,492	26,246	26,339	34.8	34.9
Wooden fencing .... lin. ft.	5,100	28	1,154	0.54	22.6
Upper gates for lock .... No.	0	0	0	0	0
Lower gates for lock .... No.	0	0	0	0	0
Gates for guard-gate .... No.	2	0	0	0	0
48-inch sluice-valve for guard-gate .... No.	1	0	0	0	0
Removing and resetting old bridge superstructure .... No.	1	0	1	0	100
Wooden sidewalks .... lin. ft.	450	0	0	0	0
Iron castings (machined) .... lbs.	24,000	25,174	25,174	104.9	104.9
All excavation (outside original lines) .... cu. yds.	18,000	4,682	18,486	26.	102.7
Additional forms, etc., for concrete .... lump sum.	All	74.2%	All	25.8	100
Additional forms, etc., for concrete .... lump sum.	$393 07	$196.53	$196.53	50	50
Gross estimate	$707,717	$225,480	$466,840	31.9	65.9

"*Contract No.* 7. For furnishing and erecting in place steel highway bridge superstructures as follows: On contract No. 3, Champlain canal, section 2 — bridge at Fort Miller, Sta. 151+



BARGE CANAL, CONTRACT NO. 1.
View showing the completed western section of Crocker's Reef dam.

84.54; bridge at Ridge Road, Sta. 173+18; Payne's bridge, Sta. 213+10. This contract was awarded to the Groton Bridge Company on August 10, 1906.

" The steel for the Fort Miller bridge and Payne's bridge has been delivered, and the erection completed during the present season.

" The following table gives the status of the work at the present time, and shows the progress during the past year:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Structural, steel .... lbs.	326,000	191,982	191,982	58.9	58.9
Railings .... lin. ft.	84	84	84	100	100
Yellow pine or Douglas fir, sawed lumber, prime .... ft. B. M.	11,000	0	0	0	0
Yellow pine or Douglas fir, sawed lumber, merchantable .... ft. B. M.	18,000	17,190	17,190	95.5	95.5
Setting stone copings .... cu. yds.	6.4	4.1	4.1	64	64
Lining .... cu. yds.	7	2	2	28.6	28.6
Gross estimate	$16,879	$9,970	$9,970	59.1	59.1

" *Contract No.* 27. For excavating the canal and protecting its sides, constructing locks Nos. 7 and 8, and Junction lock, necessary spillways, power plants and appertaining structures; a concrete arch bridge, bridge substructures and approaches; retaining walls, highways, and other incidental details, between Station 1046+16, the south end of contract No. 25, at Dunham's Basin road, Washington county, and the Hudson river, at Fort Edward, Washington county, Station 1245. This contract was awarded to the Kinser Construction Company on November 23, 1906.

" The excavation of the canal began in April, 1907, about 2,000 feet from the north end of contract, and has progressed southerly for a distance of 3,660 feet, or 18 per cent of the total length of contract.

" The type of machine used on this work is a revolving derrick, with an 80-foot boom. This operates a 'Page' bucket of two cubic yards capacity. There are two of these machines, one about 100 feet ahead of the other and on opposite sides of canal. They excavate to the full depth, forming slopes and spoiling material at the same time. The grubbing is done, where required, back of the machines as they progress.

" The following tabulation gives the total work done to date and the percentage of work done:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing .... acres.	33.1	10.39	10.39	31.4	31.4
Grubbing .... cu. yds.	12,300	2,545	2,545	20.69	20.69
All excavation .... cu. yds.	1,410,000	134,589	134,589	9.54	9.54

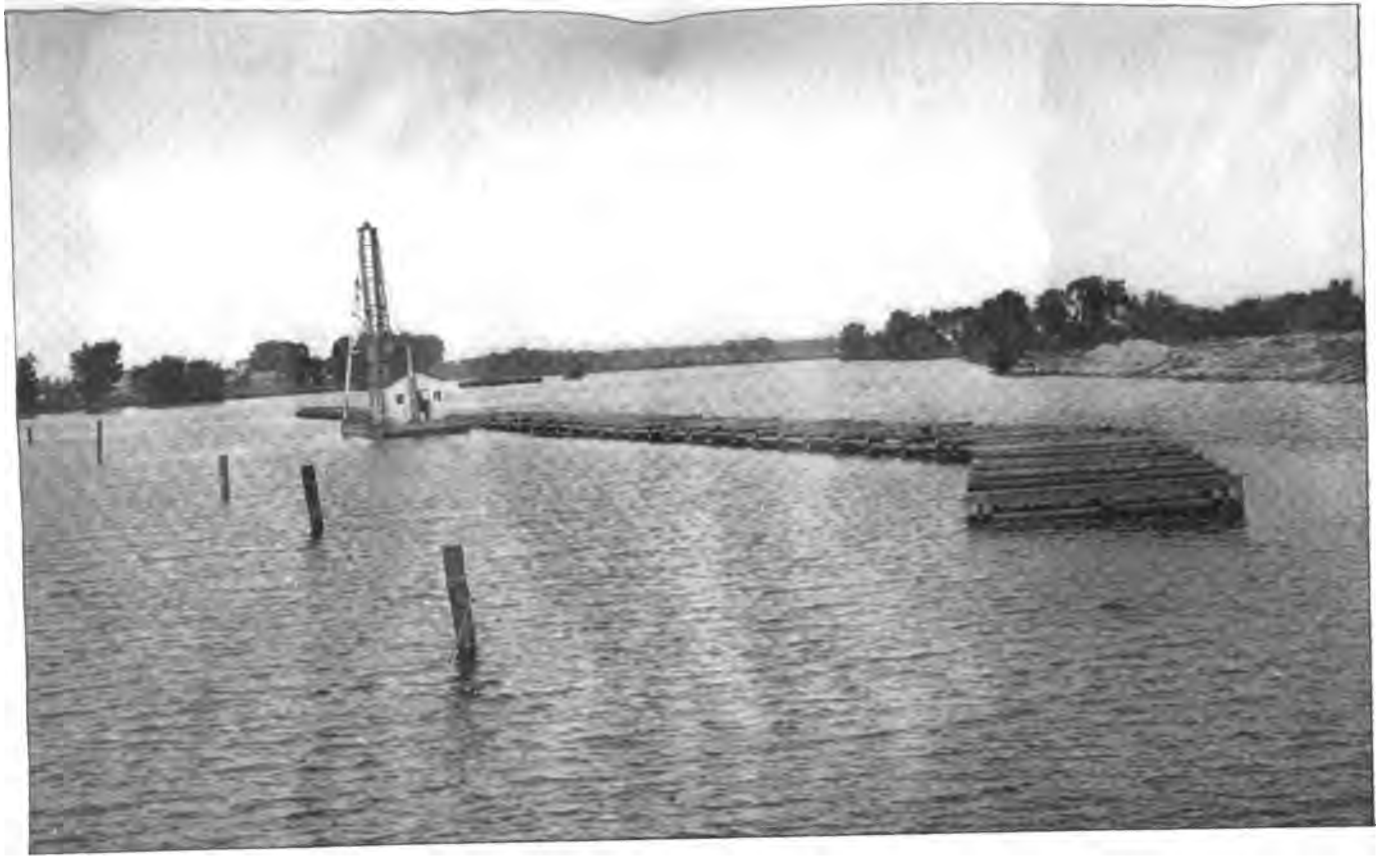
" Champlain Canal, Residency No. 3.

" This residency extends from the highway crossing at Dunham's Basin, Washington county, to Lake Champlain at Whitehall, Washington county, a distance of 19.8 miles.

" *Contract No.* 15. For excavating the canal and protecting its sides, constructing lock No. 11, dam No. 4, lock No. 12, dam No. 5, and appertaining structures, a spillway, a highway, two masonry culverts, five bridges with their piers and abutments and other incidental details between Lake Champlain at Whitehall, Washington county, Station 0–73, and Station 356, on Wood creek, about 0.6 mile north of Comstock P. O., Washington county. This contract was awarded to the Atlantic, Gulf and Pacific Company on August 9, 1906.

" The length of this contract is 6.8 miles, extending from Lake Champlain to about 0.6 mile north of Comstock. The appropriation survey work and maps have been completed, and a line parallel to the center line has been established for the entire length and concrete monuments set, and a line of levels established on the monuments.

" The contractor started operations by building dikes October 10, 1906. The dredge and large plant were built on the ground, and were started in November, 1906. Work was started on the Whitehall lock — No. 12 — in March, 1907. The dredge was started on May 30, 1907. All work has been progressing satisfactorily up to date.



BARGE CANAL, CONTRACT No. 1.
View of the breakwater pier at the north end of the land line, Crocker's Reef, showing the larger part of the timber crib.

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing ..... acres.	12.36	6.06	6.06	49	49
All excavation ..... cu. yds.	2,900,000	342,241	342,241	12	12
Sheeting and bracing ..... ft. B. M.	50,000	11,076	11,076	22	22
Embankment ..... cu. yds.	200,000	1,736	1,736	0.85	0.85
Piling ..... No.	7,300	637	637	9	9
Gross estimate	$1,509,060	$101,290	$101,290	6.5	6.5

"*Contract No.* 25. For excavating the canal and protecting its sides, constructing locks Nos. 9 and 10, necessary spillways, power plants and appertaining structures, bridge substructures and approaches, retaining walls, highways and other incidental details between Station 356, about 0.6 mile north of Comstock P. O., Washington county, and Station 1041+54, which is also Station 1046+16, at Dunham's Basin road, Washington county; length of contract, 13 miles.

"The appropriation survey work and maps have been completed, and a line parallel to the center line has been established from Fort Ann south for a distance of about four miles and concrete monuments set, and a line of levels established on the monuments.

"This contract was awarded to the Atlantic, Gulf and Pacific Company on November 19, 1906. The dredge and plant were built on the ground and started in December, 1906. Operations were started by building dikes, April 22, 1907. The dredge started August 1, 1907, and has been steadily increasing its output up to date.

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing ..... acres.	56 49	8.44	8.44	15	15
Grubbing ..... cu. yds.	38,000	829	829	2	2
All excavation ..... cu. yds.	4,763,000	205,249	205,249	4	4
Gross estimate	$1,754,236	$47,660	$47,660	3	3

IMPROVEMENT OF PUBLIC HIGHWAYS.

(Chapter 115, Laws of 1898, and amendatory acts.)

There have been 125 contracts in force in the Eastern Division during the past year, having a total length of 491.45 miles, at an estimated cost of $4,994,512.80. Thirty-four of these contracts, involving 81.25 miles of roads, have been completed, and 91 contracts are pending, with a length of 410.2 miles.

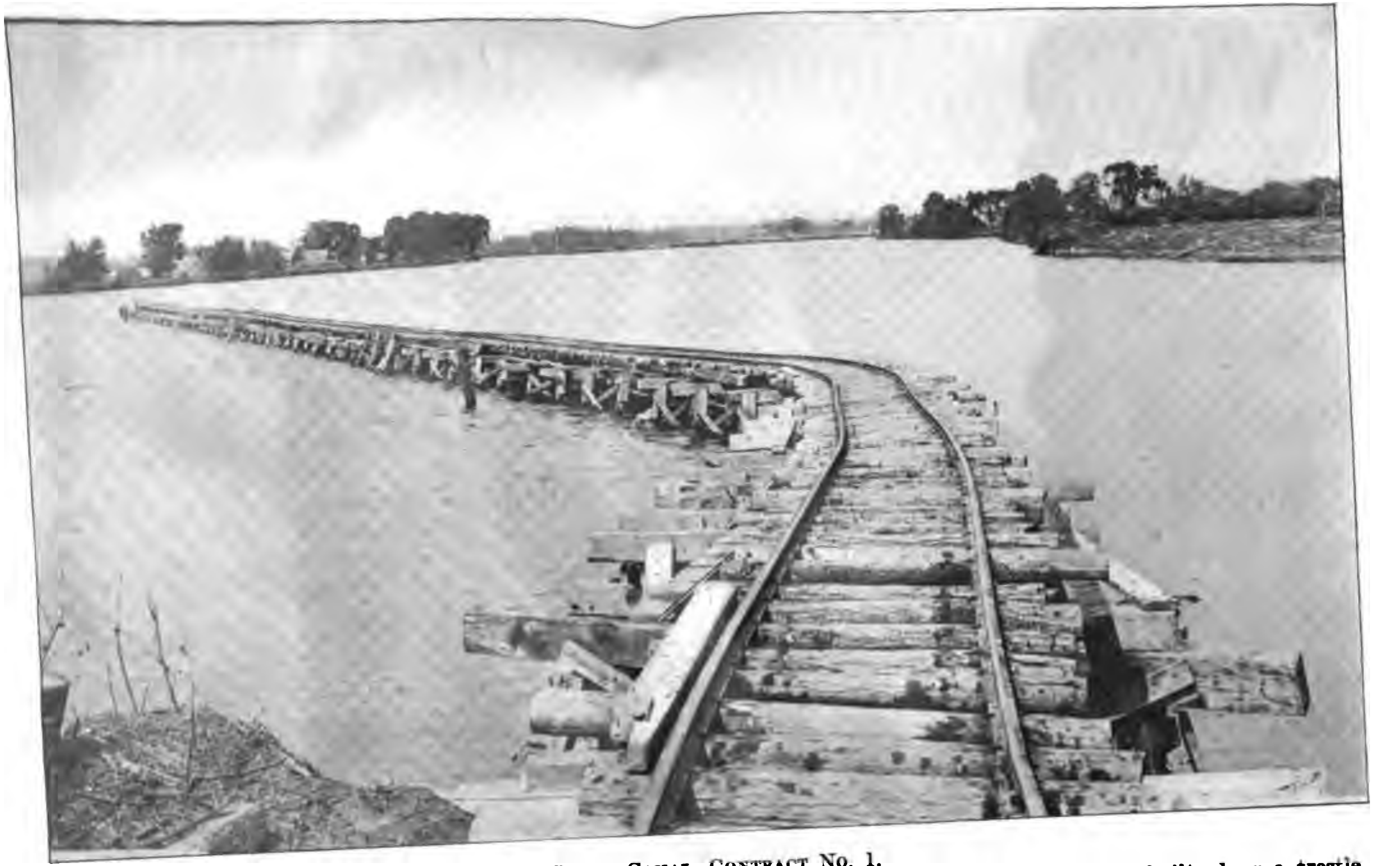
CHANGES OF PLAN.

The Highland Lake-Tompkins Cove road, No. 593, being 5.88 miles long, was awarded on September 13, 1906, at the contract price of $105,585, or nearly $18,000 per mile. Supplementary agreements have been made, increasing the contract price to $141,585, or a little more than $24,000 per mile.

The reason for this was defective or insufficient plans, in that a piled-rock construction at side-hill fills was contemplated, whereas it became necessary to substitute either rubble or concrete walls; and, again, change in type of construction from gravel to macadam road metal, at the request of the board of supervisors, was made at certain points.

The West Point-Cornwall road, No. 411, was awarded to Elmore and Hamilton, the contract price being $187,635.

This road, about 2.3 miles in length, carries with it between 1,300 and 1,400 feet of tunnel construction, the tunnel being at an elevation of some 170 feet above mean tide in the Hudson river almost directly below it. From the tunnel the road runs in either direction around the side of the mountain, necessitating heavy cutting and an enormous amount of filling, together with retaining, or supporting walls. It will probably be found necessary to make changes from time to time as the work progresses, which will add materially to the cost of this road. The United States Government is making surveys for an improved highway through the reservation property at West Point to connect with this State highway, and at an early date the State will contract for a road extending south of the reservation line to connect with what is known as the Rockland county road. This work, together with the roads that are to be built south of this point in Rockland county and are now



BARGE CANAL, CONTRACT NO. 1.

View of the breakwater pier at the north end of the land line, Crocker's Reef, showing a work track built along a trestle upon the timber crib, which has been sunk to position.

under contract or to be contracted for in Greene county, will insure a good highway on the west side of the river from the southern State line to Albany.

OIL AND TARVIA SURFACING.

During the past few months the State has experimented with tarvia and oil in order to learn which would be the more economical and lasting for the preservation of State roads. A piece of road in Orange county was treated with oil, and also two pieces in Dutchess county, at an average cost of some $97 per mile. Tarvia application to old roads was made in Westchester county, to the extent of 7.83 miles, at an average cost of $837 per mile, and in Albany county, 14.26 miles, at an average cost of $750 per mile. The excess in cost in Westchester county was occasioned by high freight rates. The application of oil was done by day's work by employees of the department, and has so far given satisfactory results. But from past experience in oiling roads, I am convinced that this process should be repeated each year.

The tarvia work was done by contract — that of the Westchester county roads being done by the Good Roads Improvement Company, of Cincinnati, and the Albany county roads being treated by J. L. Thompson, of New York. The tarvia treatment has been highly satisfactory and should insure a good surface for a number of years. I would strongly recommend that, in the drawing of contracts for new roads, where provision is made for the construction of the top course of stone, aside from trap-rock, provision be made for treating the surface with either oil or a tarvia preparation.

MAINTENANCE AND REPAIR OF IMPROVED PUBLIC HIGHWAYS.

For the repairs of State highways in this division, comprising twenty-seven counties, but $106,222.60 was available. Of this amount $78,815.48 has been expended at the end of the fiscal year, as follows:

Albany County.

Delaware Turnpike (section 1) *road, No.* 7. The work consisted of resurfacing with trap-rock and building new culverts; cost	$2,250 86

Loudon (*section* 1) *road, No.* 22. The work consisted in erecting guard-rail, building new culverts and treating a portion with tarvia; cost..........	$1,461 19
Delaware Turnpike (*section* 2) *road, No.* 41. The work consisted in resurfacing with trap-rock and building new culverts; cost.....................	3,369 33
Delaware–Slingerland road, No. 92. The work consisted in cleaning shoulders and applying oil in the village of Delmar; cost.....................	159 38
Loudon (*section* 2) *road, No.* 119. The work consisted in treating the surface with tarvia and oil; cost.	2,521 66
Delaware Turnpike (*section* 3) *road, No.* 178. The work consisted in removing slides and cleaning out the ditches; cost.........................	319 38
River road, No. 193. The work consisted in resurfacing with trap-rock and treating a section of the surface with tarvia; cost......................	3,830 64
Delaware Turnpike (*sections* 4 *and* 5) *roads, Nos.* 198 and 199. The work consisted in removing slides, cleaning out ditches and adding culverts; cost......	1,586 64

Clinton County.

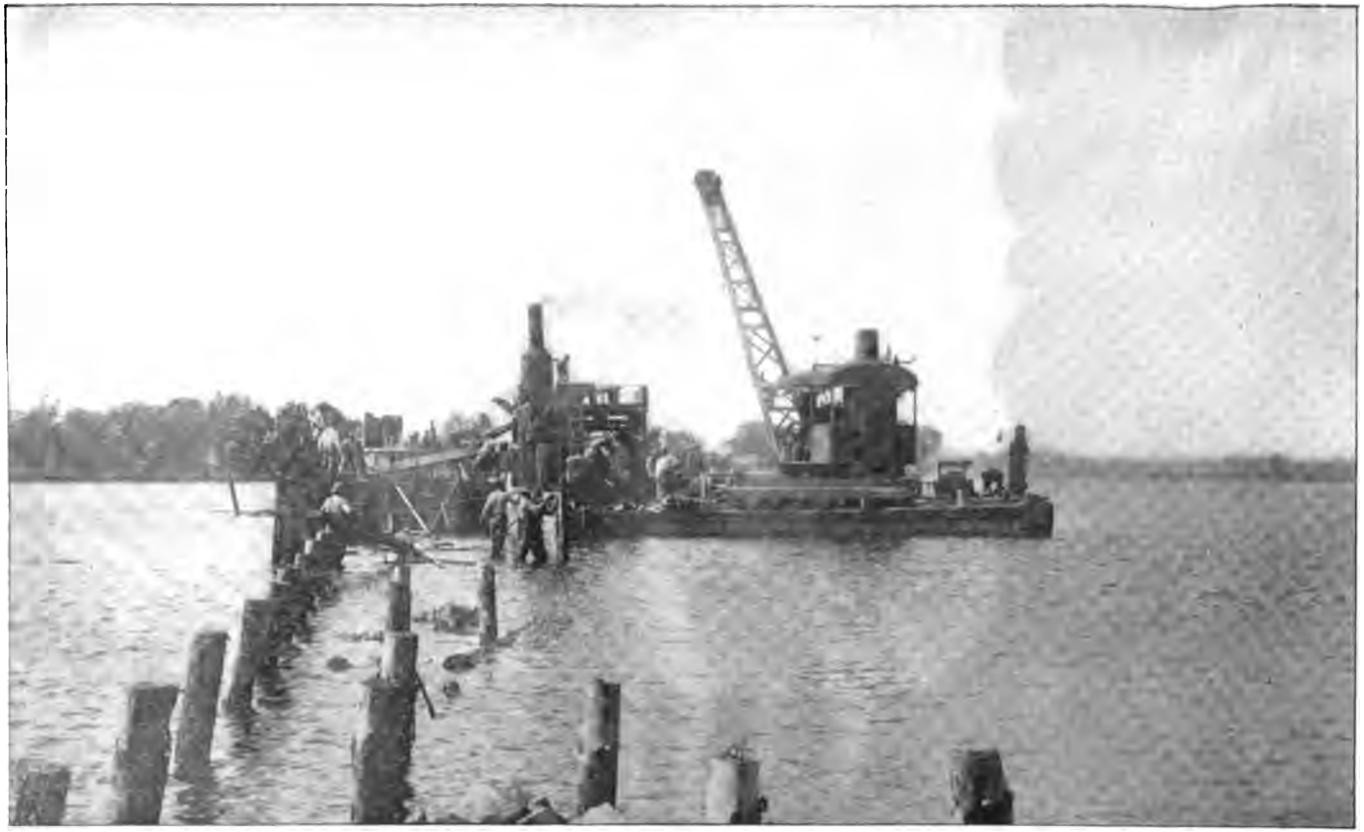
Plattsburg-Keeseville (*section* 2) *road, No.* 137. The work consisted in cleaning ditches and resurfacing and filling ruts with crushed stone; cost........	1,408 56
Plattsburg-Mooers (*section* 1) *road, No.* 138. The work consisted in resurfacing with crushed stone and in cleaning ditches; cost........................	1,125 69

Delaware County.

Delaware River road, No. 145. The work consisted in cleaning ditches and culverts and resurfacing with gravel; cost........................	378 73

Dutchess County.

Hughsonville road, No. 222. The work consisted in repairing culverts and filling ruts and depressions; cost....................................	239 69



Barge Canal, Contract No. 1.
View of the breakwater pier at the north end of the land line, Crocker's Reef, showing the building of forms for the concrete pier.

South road, No. 223. The work consisted in filling ruts and depressions and cleaning culverts and ditches; cost. $358 79

Fulton County.

Gloversville-Mayfield road, No. 33. The work consisted in cleaning out ditches, rebuilding a tile culvert and providing a wearing course of sharp sand; cost 194 38

Herkimer County.

Frankfort road, No. 14. The work consisted in cleaning ditches and resurfacing with gravel and crushed stone; cost. 539 21

Montgomery County.

West Mohawk River road, No. 108. The work consisted in partially resurfacing with ¾-inch traprock and limestone; cost. 1,489 41

Fonda, West, road, No. 155. The work consisted in cleaning out ditches and placing a wearing course of fine gravel; cost. 205 70

Orange County.

Newburgh–Woodbury road, No. 42. The work consisted in cleaning out ditches and culverts and resurfacing with gravel and crushed limestone; cost. . . 2,479 20

Cochecton Turnpike (sections 1 *and* 2) *roads, Nos.* 43 *and* 113. The work on these roads consisted in cleaning ditches and in filling depressions and ruts — with gravel on road No. 43 and with crushed stone on road No. 113; cost. 2,047 19

Goshen–Florida road, No. 44, *and Florida–Warwick road, No.* 93. The work consisted in cleaning culverts and ditches, filling depressions, and macadamizing a section of road No. 44 near the village of Goshen; cost. 2,172 26

Middletown-Pine Bush road, No. 45. The work consisted in cleaning out culverts and ditches and filling in depressions; cost	$132 28
Walden-Scott's Corners road, No. 64. The work consisted in cleaning out culverts and ditches and filling depressions with gravel; cost	102 70
Middletown-Goshen road, No. 95. The work consisted in cleaning out culverts and ditches and filling in depressions; cost	92 84
Montgomery-Goshen road, No. 65, *and Newburgh-Campbell Hall road, No.* 153. The work consisted in resurfacing with gravel and cleaning culverts and ditches; cost	1,038 26
Newburgh-Shawangunk road, No. 161. The work consisted in treating one mile of the road from the Newburgh city line with oil; cost	131 44
Turners-Monroe road, No. 46, *and Central Valley-Turner road, No.* 115. The work consisted in cleaning out ditches and culverts and resurfacing bad spots; cost	127 00
Chester-Goshen road, No. 156. The work consisted in cleaning out culverts and ditches and resurfacing bad spots; cost	1,048 70
Middletown-State Hill road, No. 159. The work consisted in cleaning out culverts and ditches and filling in depressions; cost	83 70

Otsego County.

Oneonta road, No. 162. The work consisted in repairing culvert and filling depressions and ruts; cost	275 00
Richfield Springs-Cherry Valley road, No. 219. The work consisted in cleaning ditches and culverts and filling ruts and depressions; cost	292 87
Worcester road, No. 220. The amount spent on account of engineering inspection for fall repairs was	8 52
Edmeston road, No. 221. The work consisted in resurfacing the bad places with gravel and filling depressions; cost	112 87

CONTRACT No. 1. completed and a

Rensselaer County.

Troy–Greenbush (sections 1 *and* 2) *roads, Nos.* 11 *and* 26, *and Barracks road, No.* 102. The work consisted in furnishing and placing ¾-inch trap-rock; cost	$1,108	16
Albia–Wynantskill road, No. 77. The work consisted in resurfacing with trap-rock; cost	13,482	28
Troy–Brunswick (sections 1 *and* 2) *roads, Nos.* 10 *and* 25. The work consisted in cleaning culverts and ditches and resurfacing with crushed stone; cost.	3,692	21
Hoags Corners road, No. 55. The amount expended on account of engineering inspection for fall repairs was	12	00
Sand Lake–Troy road, No. 194. The work consisted in scraping shoulders and reshaping road; cost.	66	50

Saratoga County.

Waterford (sections 1 *and* 2) *roads, Nos.* 39 *and* 59. The work consisted in repairing culverts and partially resurfacing with trap-rock; cost	4,804	49
Glens Falls–Saratoga road, No. 58. The work consisted in partially resurfacing with trap-rock; cost.	651	33

Schenectady County.

Broadway–Fort Hunter road, No. 163. The work consisted in resurfacing ruts and depressions with crushed stone; cost	174	02

Ulster County.

Ulster–Delaware (sections 1, 2 *and* 3) *roads, Nos.* 16, 117 *and* 31, *and Kingston–Rifton road, No.* 116. The work consisted in cleaning away heavy earth and rock slides and cleaning out ditches; cost	1,889	07
Saugerties–Woodstock (sections 1, 2 *and* 3) *roads, Nos.* 37, 38 *and* 142. The work consisted in resurfacing with crushed stone, relaying pipe culverts and cleaning shoulders and ditches; cost	1,834	40

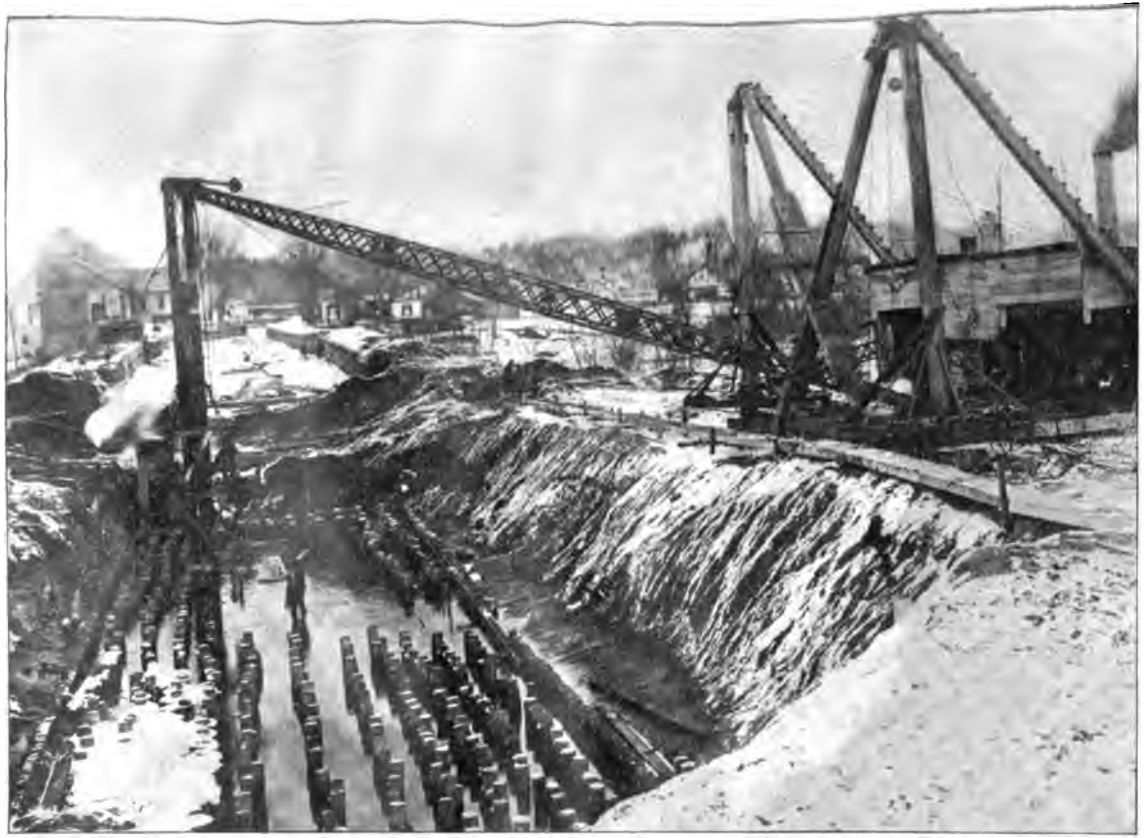
Washington County.

Fort Edward–Sandy Hill road, No. 85. The work consisted in repairing washout and guard-rail; cost..	$17 85
Shunpike road, No. 97. The work consisted in repairing guard-rail, rebuilding culverts and cleaning ditches; cost....................................	895 59
Granville–Middle Granville road, No. 103, *and Granville–Troy Stage road, No.* 104. The work consisted in resurfacing with gravel and cleaning culverts and ditches; cost..............................	1,526 98

Westchester County.

Ardsley Elmsford (sections 1 *and* 2) *roads, Nos.* 18 *and* 34. The work consisted in resurfacing with screenings and cleaning shoulders and ditches; cost...	1,193 69
Mamaroneck–White Plains road, No. 19, *White Plains–Armonk road, No.* 35, *and White Plains–Cross Road, No.* 20. The work consisted in resurfacing portions of the roads with limestone screenings and trap-rock, cleaning ditches and treating a section of No. 20 with oil; cost..................	7,138 68
Armonk–Mt. Kisco road, No. 50, *and Mt. Kisco–Bedford road, No.* 51. The work consisted in lowering several culverts, cleaning ditches and resurfacing with trap-rock; cost................................	8,611 98
Unionville–McKeels Corners road, No. 52. The amount spent in engineering inspection and estimates for fall repairs was............................	132 18

Detailed accounts of highway contracts completed during the year, and also those now pending are appended, as follows:



BARGE CANAL, CONTRACT NO. 27.

View of the driving of a pile foundation for a small lock in the Champlain canal at its junction with the Barge canal at Fort Edward. A novel contrivance for driving the piles is here shown, the guides of an ordinary pile-driver being attached to the end of a derrick boom, so that the hammer might be shifted to all parts of the foundation without the usual delay of moving the whole driver.

CONTRACTS COMPLETED DURING THE YEAR ENDING SEPTEMBER 30, 1907.

Turk Hill–Putnam County Line Road, No. 151, Westchester County.

Length, 5.99 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $70,650.

Contract dated, June 19, 1903.

Work commenced, April, 1905.

Work completed, December, 1906.

Final account, $55,484.26.

Contractors, Ganung and Hoyt.

Engineer in charge, Perry Filkin.

Road No. 151 affords a continuous macadam road along the east side of Westchester county for a distance of about 31 miles, commencing at the corporate lines of White Plains and extending northerly through the villages of Valhalla, Kensico, Armonk, New Castle, Bedford, Cross River, Salem Center, North Salem to the Putnam county line. Local granitic rock was used in forming both courses of the macadam on this road. Sand and granitic rock screenings were used as a binder.

Additional Work on Fonda, East, Road, No. 152–A, Montgomery County.

Length, 2.50 miles.

Engineer's preliminary estimate of total cost, including engineering, $3,267.

Contract dated, November 7, 1906.

Work commenced, April, 1907.

Work completed, August, 1907.

Final account, $3,191.43.

Contractor, D. I. Snell & Co.

Engineers in charge, J. B. Wright and R. H. Sammons.

This work consisted in scraping the surface and placing broken trap-rock on same, erecting extra guard-rail and furnishing ¾-inch trap-rock for maintenance.

ADDITIONAL WORK ON CHESTER–GOSHEN ROAD, NO. 156–A, ORANGE COUNTY.

Length, 3.10 miles.

Engineer's preliminary estimate of total cost, including engineering, $628.25.

Contract dated, September 1, 1906.

Work commenced, September, 1906.

Work completed, October, 1906.

Final account, $597.

Contractor, The Orange County Road Construction Co.

Engineers in charge, F. W. Williams and A. W. Smith.

This work consisted in scraping the surface and placing mineral oil on the same, to lay the dust.

NORTHAMPTON ROAD, NO. 158, MONTGOMERY COUNTY.

Length, 0.7 mile.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $7,665.

Contract dated, September 1, 1906.

Work commenced, May, 1907.

Work completed, August, 1907.

Final account, $6,809.63.

Contractor, Alonzo Schaupp.

Engineers in charge, E. A. Lamb, J. B. Wright and C. R. DeGraff.

Road No. 158 extends from the north line of the farm of Stephen Sanford and Sons to the Fulton county line. Local stone was used on both courses of this road.

SLATE HILL–UNIONVILLE ROAD, NO. 160, ORANGE COUNTY.

Length, 8.38 miles.

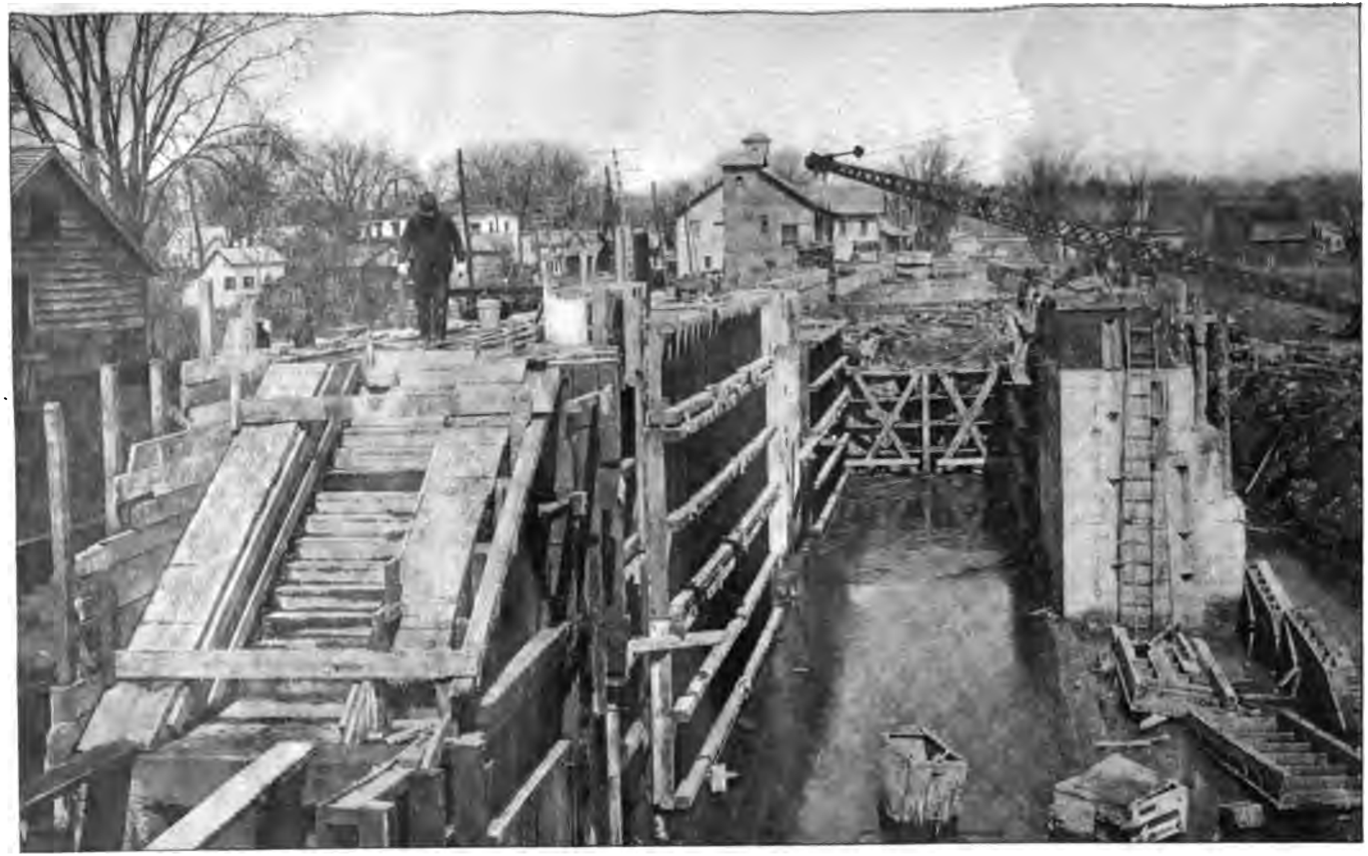
Width of gravel, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $52,000.

Contract dated, June 18, 1904.

Work commenced, August, 1904.

Work completed, December, 1906.



Barge Canal, Contract No. 27.

View at the junction lock, Champlain canal, Fort Edward, showing progress in constructing the concrete walls.

Final account, $46,301.05.

Contractor, The Orange County Road Construction Co.

Engineers in charge, F. M. Williams, M. W. Williams and E. A. Faille.

Road No. 160 joins Road No. 159 on the northeast at Slate Hill and extends to the village of Unionville on the southwest. Local gravel was used to form the wearing surface.

ADDITIONAL WORK ON DELAWARE TURNPIKE ROAD, NO. 178–A, ALBANY COUNTY.

Length, 7.38 miles.

Engineer's preliminary estimate of total cost, including engineering, $3,094.45.

Contract dated, October 16, 1906.

Work commenced, December, 1906.

Work completed, January, 1907.

Final account, $3,025.

Contractor, John H. Gordon.

Engineer in charge, L. L. Melius.

This work consisted in furnishing ¾-inch and 1½-inch limestone and placing the same in neat piles along the road for maintenance.

ADDITIONAL WORK ON MOHAWK RIVER TURNPIKE ROAD, NO. 180–A, MONTGOMERY COUNTY.

Length, 2.82 miles.

Engineer's preliminary estimate of total cost, including engineering, $924.97.

Contract dated, November 7, 1906.

Work commenced, November, 1906.

Work completed, December, 1906.

Final account, $891.50.

Contractor, Alonzo Schaupp.

Engineer in charge, H. E. Poole.

This work consisted in scraping the surface and placing ¾-inch trap-rock on same.

ADDITIONAL WORK ON RIVER ROAD, NO. 193–A, ALBANY COUNTY.

Length, 8.13 miles.

Engineer's preliminary estimate of total cost, including engineering, $8,234.46.

Contract dated, May 29, 1906.

Work commenced, July, 1906.

Work completed, November, 1906.

Final account, $7,105.69.

Contractor, Joseph Walker.

Engineer in charge, H. C. Titus.

This work consisted in placing mile posts along the entire length of the road, removing trees, shaping the road and furnishing and placing in piles along the road ¾-inch trap-rock for maintenance.

WYNANTSKILL–WEST SAND LAKE ROAD, NO. 195, RENSSELAER COUNTY.

Length, 4.01 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $39,400.

Contract dated, June 23, 1904.

Work commenced, October, 1904.

Work completed, October, 1906.

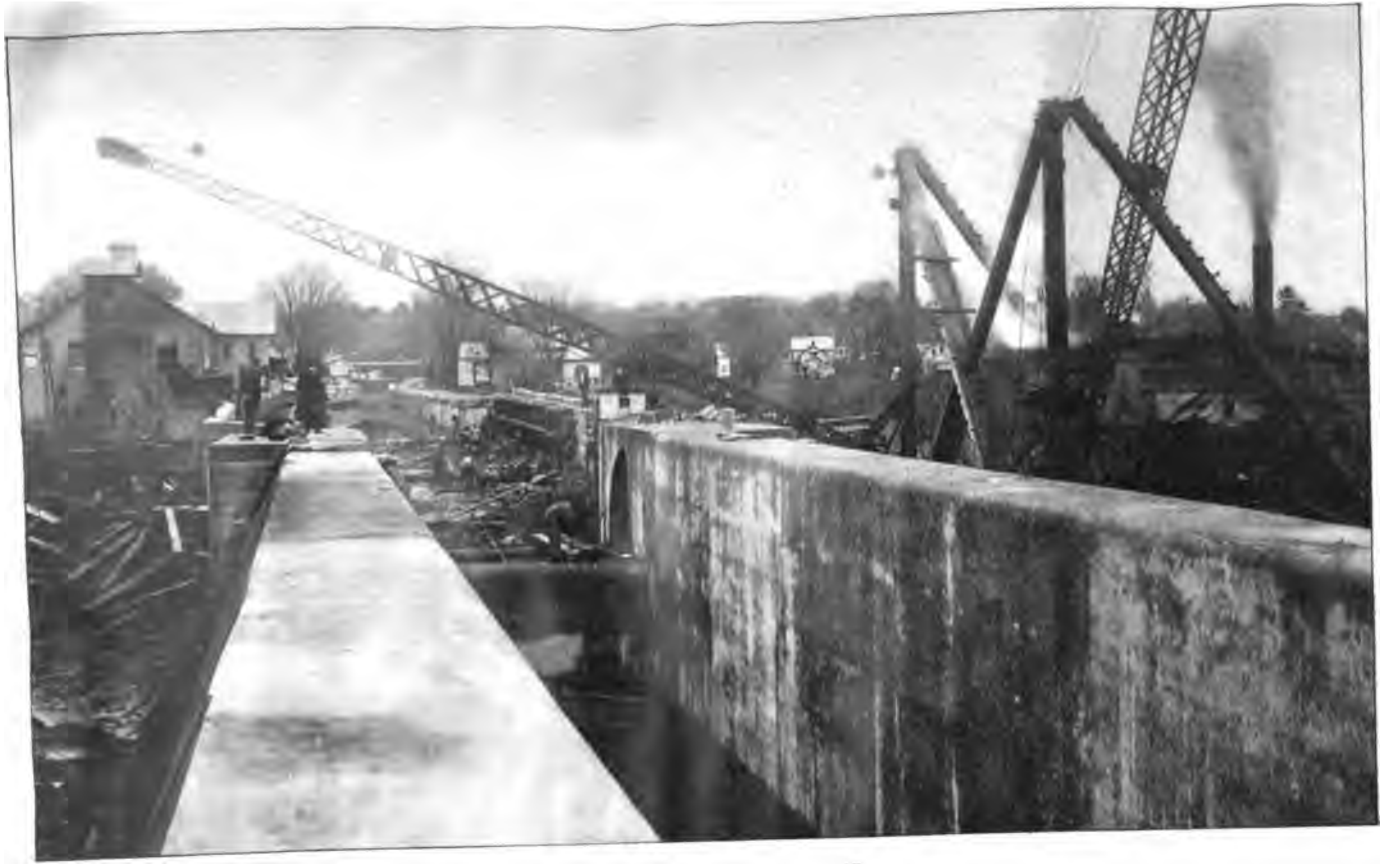
Final account, $35,180.18.

Contractor, Thomas H. Karr.

Engineer in charge, Ralph Russell.

Road No. 195 extends from the village of West Sand Lake, northerly to State Road No. 77, in the village of Wynantskill. This road when completed, together with Road No. 77, will afford a continuous macadam road from the city line of Troy to West Sand Lake.

Local stone was used to form the macadam in both courses of this road. Sand was used as a filler for bottom course, and local stone screenings were used as a binder for the top course.



Barge Canal, Contract No. 27.

View of the junction lock, Champlain canal, at Fort Edward, showing the concrete masonry of the lock about completed.

ADDITIONAL WORK ON EAST NASSAU ROAD, No. 196-A, RENSSELAER COUNTY.

Length, 3.02 miles.

Engineer's preliminary estimate of total cost, including engineering, $744.50.

Contract dated, August 18, 1906.

Work commenced, October, 1906.

Work completed, November, 1906.

Final account, $677.50.

Contractor, Edward Rendert.

Engineer in charge, Foster B. Morss.

This work consisted of shaping and scraping the roadway and placing loam on the surface.

TROY-POESTENKILL ROAD, No. 201, RENSSELAER COUNTY.

Length, 3.60 miles.

Width of macadam, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $33,450.

Contract dated, June 13, 1904.

Work commenced, June, 1905.

Work completed, December, 1906.

Final account, $27,558.34.

Contractor, William H. Masterson.

Engineer in charge, E. W. Sylvester.

Road No. 201 extends from the old toll gate on the Troy-Sand Lake road, easterly to Hunt's hotel in the village of Poestenkill. This is a continuation of Road No. 77 which starts at the city line of Troy.

Local stone was used to form the macadam in both courses of this road. Sand was used as a filler for the bottom course, and local stone screenings were used as a binder for the top course.

ADDITIONAL WORK ON TROY-POESTENKILL ROAD, No. 201-A, RENSSELAER COUNTY.

Length, 3.60 miles.

Engineer's preliminary estimate of total cost, including engineering, $2,977.76.

Contract dated, December 13, 1906.

Work commenced, January, 1907.

Work completed, April, 1907.

Final account, $2,938.52.

Contractor, John Schuman, Jr.

Engineers in charge, James T. Brady and E. W. Sylvester.

This work consisted of furnishing and placing in piles along the road ¾-inch broken local stone and local stone screenings for maintenance.

ADDITIONAL WORK ON KINGSTON–SAUGERTIES ROAD, No. 228–A, ULSTER COUNTY.

Length, 5.66 miles.

Engineer's preliminary estimate of total cost, including engineering, $3,800.

Contract dated, December 7, 1906.

Work commenced, December, 1906.

Work completed, July, 1907.

Final account, $3,447.50.

Contractor, John E. Consalus.

Engineer in charge, H. C. Titus.

This work consisted in making a large fill, erecting guard-rail and furnishing ¾-inch stone in piles along the road for maintenance.

OLD STATE ROAD, No. 232, ESSEX COUNTY.

Length, 2.64 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $21,700.

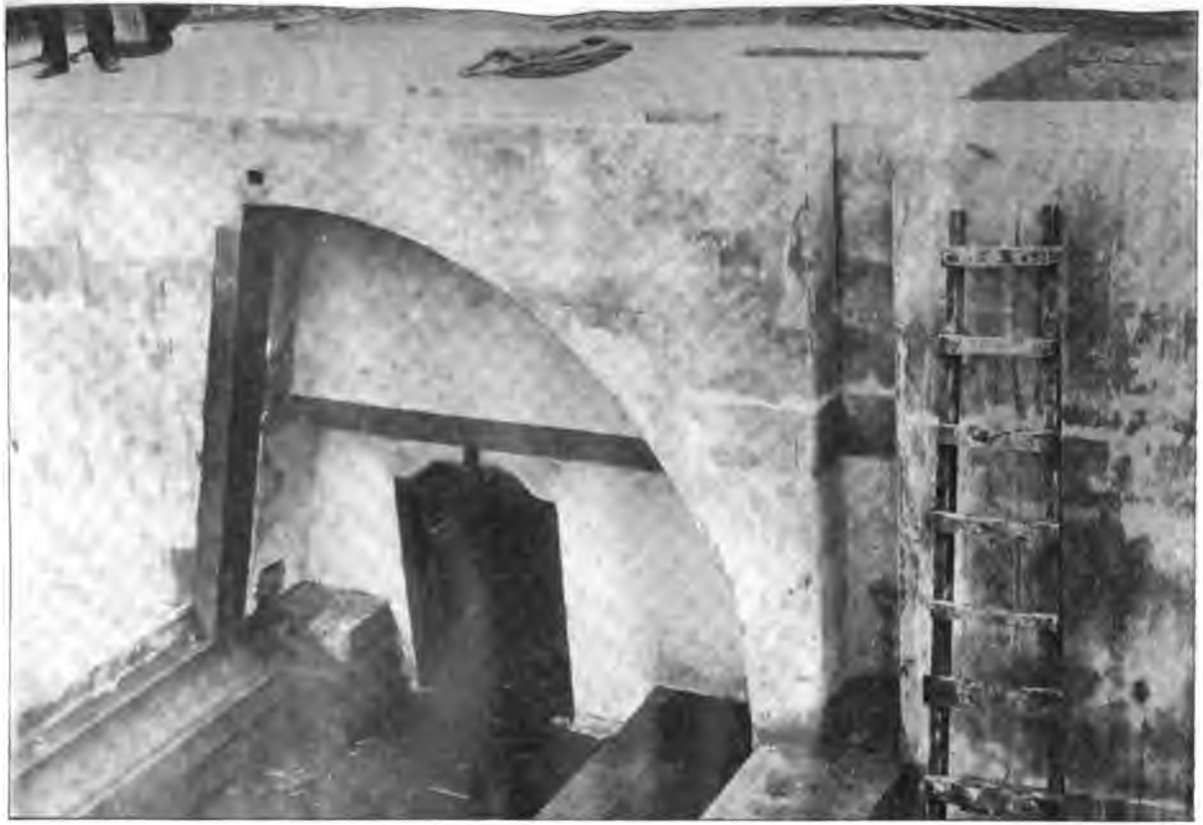
Contract dated, July 9, 1906.

Work commenced, August, 1906.

Work completed, September, 1907.

Final account, $18,904.55.

Contractor, The Clinton Beckwith Engineering and Contracting Co.



Barge Canal, Contract No. 27.

View of the junction lock, Champlain canal, at Fort Edward, showing details of construction at one of the gates. When the photograph was taken, the tumble-gate had not been placed in position.

Engineer in charge, F. J. Mulvaney.

Road No. 232 extends southerly from the village of Keeseville to the highway near the property of A. H. Mace in the town of Chesterfield. Local stone was used for all three courses of this road.

OLD PLANK ROAD, NO. 249, FULTON COUNTY.

Length, 3.14 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $28,000.

Contract dated, July 6, 1906.

Work commenced, August, 1906.

Work completed, August, 1907.

Final account, $25,488.74.

Contractor, The Buckley Construction Company.

Engineers in charge, John B. Wright, E. A. Lamb, R. J. Murray and O. L. Eltinge.

Road No. 249 extends from the Montgomery county line, northerly to the town line of Broadalbin in the town of Perth. Local stone was used for all three courses of this road.

BIRCH HILL ROAD, NO. 270, NASSAU COUNTY.

Length, 1.16 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $14,950.

Contract dated, July 10, 1906.

Work commenced, August, 1906.

Work completed, July, 1907.

Final account, $10,639.88.

Contractors, Andrews Brothers.

Engineers in charge, James L. Chapman and J. R. Kaley.

Road No. 270 is a continuation of State Road, No. 435, at Lattington and extends southeasterly to the highway near Birch hill. Trap-rock was used for all three courses of this road.

TROY–SAND LAKE (SECTION 2) ROAD, NO. 288, RENNSELAER COUNTY.

Length, 3.72 miles.

Width of gravel, 18 feet.

Engineer's preliminary estimate of total cost, including engineering, $20,800.

Contract dated, July 3, 1906.

Work commenced, July, 1906.

Work completed, June, 1907.

Final account, $15,252.58.

Contractor, John H. Gordon.

Engineers in charge, J. T. Brady and H. S. Mattimore.

Road No. 288 is a continuation of State Road, No. 194, and extends northerly to State Road, No. 201. Gravel was used for the wearing surface of this road.

DE GRAFF'S CORNERS–SHERBURNE'S CORNERS ROAD, NO. 300, MONTGOMERY COUNTY.

Length, 1.13 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $10,200.

Contract dated, July 11, 1906.

Work commenced, August, 1906.

Work completed, November, 1906.

Final account, $9,727.58.

Contractor, Joseph Walker.

Engineer in charge, C. R. De Graff.

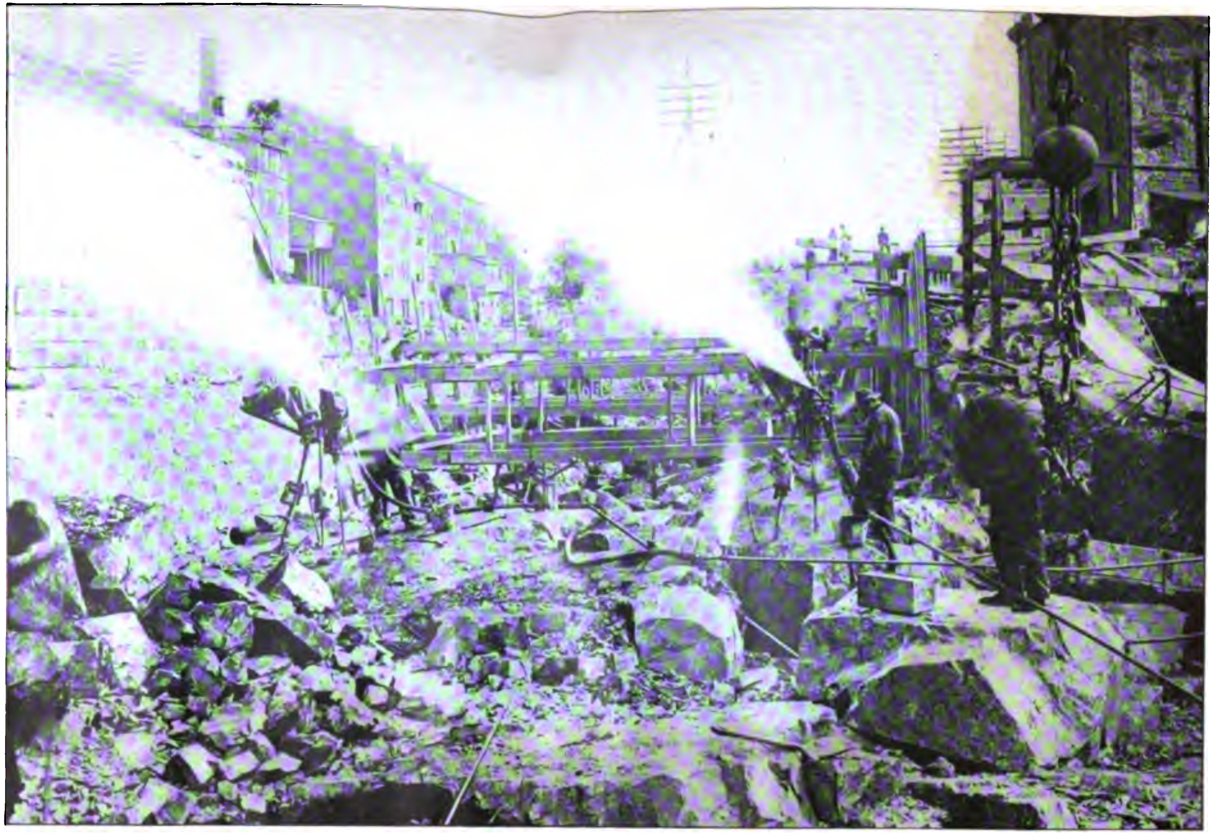
Road No. 300 extends from State Road, No. 96, near the property of Chas. De Graff, westerly to the corner near the property of John Sherburne, in the town of Florida. Local stone was used for the two courses of this road.

MINAVILLE–SCOTCH BUSH ROAD, NO. 301, MONTGOMERY COUNTY.

Length, 2.34 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $20,900.



Barge Canal, Contract No. 15.
View at Comstock, showing steam-drills at work in excavating at site of lock No. 12.

Contract dated, July 9, 1906.

Work commenced, August, 1906.

Work completed, September, 1907.

Final account, $14,495.93.

Contractor, The Clinton Beckwith Engineering and Contracting Co.

Engineers in charge, C. R. DeGraff, H. E. Poole and J. B. Wright.

Road No. 301 extends from State Road, No. 96, at Minaville, southeasterly to the schoolhouse property in Scotch Bush. Local stone was used for the two courses of this road.

FONDA–BERRYVILLE ROAD, NO. 302, MONTGOMERY COUNTY.

Length, 2 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $16,300.

Contract dated, July 9, 1906.

Work commenced, July, 1906.

Work completed, September, 1907.

Final account, $15,848.39.

Contractor, D. I. Snell & Co.

Engineers in charge, H. L. Michael in 1906; E. A. Lamb, J. P. Wright and R. H. Sammons in 1907.

Road No. 302 connects the villages of Fonda and Berryville. Local stone was used for bottom course of this road, and trap-rock or hard gneiss for middle and top courses.

COLLIERSVILLE–EMMONS ROAD, NO. 316, OTSEGO COUNTY.

Length, 1.26 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $13,100.

Contract dated, July 10, 1906.

Work commenced, August, 1906.

Work completed, July, 1907.

Final account, $11,667.85.

Contractors, Siver and Gould.

Engineers in charge, J. C. Patrick and Wm. Payne.

Road No. 316 extends from the town line of Milford, southwesterly to State Road, No. 162, at Emmons. Local stone was used for all three courses of this road.

COLLIERSVILLE-MILFORD CENTER ROAD, NO. 318, OTSEGO COUNTY.

Length, 2.03 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $20,700.

Contract dated, June 30, 1906.

Work commenced, August, 1906.

Work completed, July, 1907.

Final account, $17,021.15.

Contractor, S. B. Van Wagonen.

Engineer in charge, J. C. Patrick.

Road No. 318 extends from the highway intersection at Colliersville, northerly to the bridge near the property of Melvin Seegar. Local stone was used for the two courses of this road.

PAWLING-PATTERSON ROAD, NO. 343, DUTCHESS COUNTY.

Length, 2.23 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $24,350.

Contract dated, July 7, 1906.

Work commenced, September, 1906.

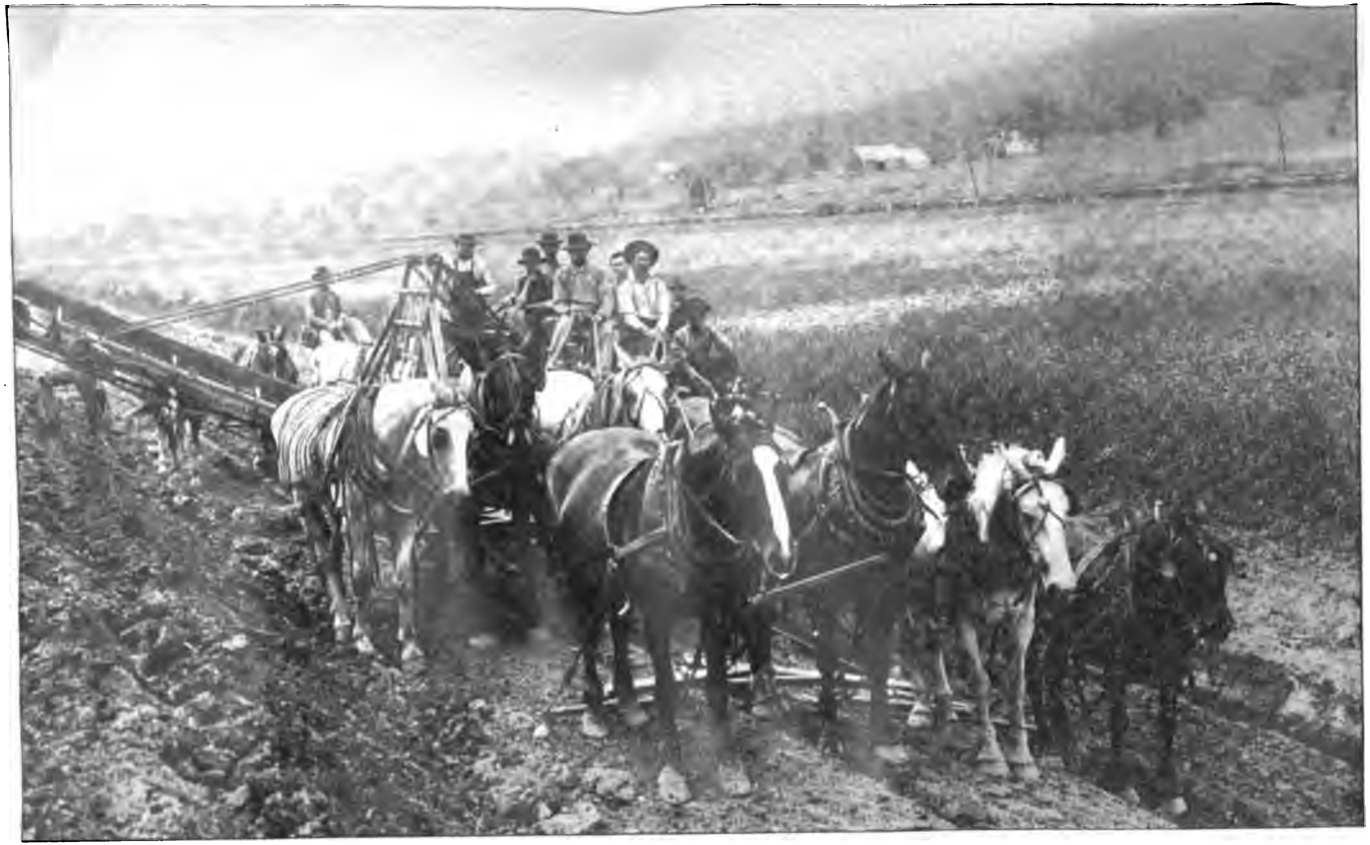
Work completed, August, 1907.

Final account, $21,787.47.

Contractor, The General Construction Company.

Engineers in charge, E. J. Howe and J. R. Kaley.

Road No. 343 extends from the Putnam county line, northerly to the village line of Pawling. Local stone was used for the two courses of this road.



Barge Canal, Contract No. 15.
Wheeled grader at work building levees to retain spoil from hydraulic dredge.

MILLERTON–NORTH EAST CENTER ROAD, NO. 344, DUTCHESS COUNTY.

Length, 1.78 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $19,950.

Contract dated, July 9, 1906.

Work commenced, September, 1906.

Work completed, August, 1907.

Final account, $16,234.01.

Contractor, The Lane Construction Corporation.

Engineers in charge, Alfred L. Simmons and J. R. Kaley.

Road No. 344 extends from the village line of Millerton, southeasterly to the Poughkeepsie turnpike at North East Center. Approved local stone was used for all three courses of this road.

POLAND–COLD BROOK ROAD, NO. 360, HERKIMER COUNTY.

Length, 0.35 mile.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $4,150.

Contract dated, July 2, 1906.

Work commenced, August, 1906.

Work completed, October, 1906.

Final account, $3,739.53.

Contractor, Alonzo Schaupp.

Engineer in charge, O. J. Dempster.

Road No. 360 extends from the village line of Poland, northeasterly to the village line of Cold Brook. Approved stone with sand filler was used for bottom course of this road, and traprock, granite or gneiss for middle and top courses including binder.

GUILDERLAND CENTER–GUILDERLAND ROAD, NO. 365, ALBANY COUNTY.

Length, 1.89 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $17,990.

Contract dated, July 3, 1906.

Work commenced, July, 1906.

Work completed, September, 1907.

Final account, $14,938.61.

Contractor, James H. Malcolm.

Engineers in charge, Ludlow L. Melius, R. N. Barrett and H. L. Michael.

Road No. 365 extends from State Road, No. 177, at Guilderland Center, easterly to the Western turnpike near Guilderland. Local stone with sand filler was used for the bottom course of this road, and trap-rock for middle and top courses with screenings for binder.

NEW SCOTLAND–WOLF HILL ROAD, NO. 366, ALBANY COUNTY.

Length, 6.85 miles.

Width of macadam, 12 and 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $88,900.

Contract dated, July 11, 1906.

Work commenced, July, 1906.

Work completed, August, 1907.

Final account, $70,831.66.

Contractor, Joseph Walker.

Engineers in charge, Ludlow L. Melius and Mark W. Nelson.

Road No. 366 extends from State Road, No. 124, at New Scotland, southwesterly through New Salem to State Road, No. 198, at Wolf Hill. Local stone was used for the two courses of this road.

GLENMONT–FEURA BUSH ROAD, NO. 367, ALBANY COUNTY.

Length, 6.77 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $62,750.

Contract dated, July 6, 1906.

Work commenced, July, 1906.

Work completed, August, 1907.

Final account, $57,706.94.

Contractor, The Buckley Construction Company.

Engineers in charge, Ludlow L. Melius, Wm. R. Trumbull and H. A. Knapp.

Road No. 367 extends from State Road, No. 193, at Glenmont, southeasterly through Bethlehem Center to the highway intersection near the property of A. J. Wiltsie in Feura Bush. Local stone with sand filler was used for bottom course of this road, and limestone for top course with screenings for binder.

ARRANDALE–BAY VIEW ROAD, NO. 434, NASSAU COUNTY.

Length, 1.69 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $13,800.

Contract dated, July 10, 1906.

Work commenced, September, 1906.

Work completed, August, 1907.

Final account, $15,283.67.

Contractors, Andrews Brothers.

Engineers in charge, James L. Chapman and J. R. Kaley.

Road No. 434 extends from the Middle Neck macadam road at Great Neck village, westerly and northerly to the Wharf road. Approved stone was used for bottom course of this road; traprock for middle and top courses, with screenings for binder.

SOUTH GLENWOOD–MEETING HOUSE ROAD, NO. 435, NASSAU COUNTY.

Length, 1.94 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $21,005.75.

Contract dated, September 1, 1906.

Work commenced, September, 1906.

Work completed, August, 1907.

Final account, $20,374.06.

Contractors, Peace Brothers.

Engineers in charge, James L. Chapman and J. R. Kaley.

Road No. 435 extends from the Glen Cove back road, southwesterly to Hempstead Harbor, and from the Glen Cove–Oyster Bay macadam road northerly to the Glen Cove–Locust Valley macadam road, including both forks north of the residence of Townsend D. Cocks. Local stone with sand filler was used for bottom course of this road, and trap-rock for middle and top courses with screenings for binder.

NORTHEAST CENTER–SHARON STATION ROAD, NO. 534, DUTCHESS COUNTY.

Length, 3.65 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $37,100.

Contract dated, July 9, 1906.

Work commenced, April, 1907.

Work completed, September, 1907.

Final account, $31,184.54.

Contractor, The Lane Construction Corporation.

Engineers in charge, John R. Kaley, P. Filkin and Alfred Simmons.

Road No. 534 extends from the end of State Road, No. 344, at Northeast Center, southerly to the town line of Amenia near Sharon station. Local stone was used for the two courses of this road.

VIOLET AVENUE–EAST PARK ROAD, NO. 550, DUTCHESS COUNTY.

Length, 1.99 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $18,100.

Contract dated, August 28, 1906.

Work commenced, April, 1907.

Work completed, August, 1907.

Final account, $15,578.97.

Contractors, Hinman and Spraul.

Engineers in charge, J. R. Kaley and N. A. Taylor.

Road No. 550 extends from the northerly end of State Road, No. 135, northerly to the road corners at East Park. Local stone was used for all three courses of this road.

FISHKILL–HUGHSONVILLE ROAD, No. 551, DUTCHESS COUNTY.

Length, 2.91 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $25,700.

Contract dated, July 10, 1906.

Work commenced, August, 1906.

Work completed, September, 1907.

Contractors, McNamee and Rice.

Final account, $23,851.91.

Engineers in charge, Charles T. Fisher and John R. Kaley.

Road No. 551 extends from the corporation line of the village of Fishkill, northerly to State Road, No. 222, at Wappinger town line. Local stone was used for the two courses of this road.

SCHENECTADY–GUILDERLAND ROAD, No. 577, SCHENECTADY COUNTY.

Length, 7.10 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $58,200.

Contract dated, July 9, 1906.

Work commenced, July, 1906.

Work completed, July, 1907.

Final account, $51,875.79.

Contractor, Jeremiah T. Finch.

Engineer in charge, William E. Petty.

Road No. 577 extends from the Schenectady city line at Guilderland avenue, southerly to the Albany county line and from the N. Y. C. railroad near the village of Carmen, southerly to the Albany county line, and from State Road, No. 163, southeasterly and then northeasterly to the Schenectady city line at the bridge over N. Y. C. railroad. Local stone was used for the two courses of this road.

CONTRACTS PENDING SEPTEMBER 30, 1907.

CHESTER–VAIL'S GATE ROAD, NO. 154–A, ORANGE COUNTY.

Length, 11.49 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $25,509.

Contract dated, July 20, 1906.

Work commenced, October, 1906.

Work completed, 92 per cent.

Contractor, Orange County Road Construction Co.

Engineers in charge, F. W. Hartwell, F. N. Sanders and J. R. Kaley.

Road No. 154-A extends from the village of Chester easterly to Vail's Gate, in the towns of Chester, Blooming Grove, Cornwall and New Windsor. Local stone is being used on both courses of this road.

WOODBURY–CENTRAL VALLEY ROAD, NO. 157, ORANGE COUNTY.

Length, 3.48 miles.

Width of gravel, 18 feet.

Engineer's preliminary estimate of total cost, including engineering, $24,330.

Contract dated, July 20, 1906.

Work commenced, July, 1906.

Work completed, 90 per cent.

Contractor, Orange County Road Construction Co.

Engineers in charge, R. D. Hayes and J. R. Kaley.

Road No. 157 connects Woodbury and Central Valley. This road is being constructed with gravel surface.

NEWBURGH–SHAWANGUNK ROAD, NO. 161, ORANGE COUNTY.

Length, 8.61 miles.

Width of shale and macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $54,120.

Contract dated, June 18, 1904.

Work commenced, August, 1904.

Work completed, 85 per cent.

Contractor, The Orange County Road Construction Co.

Engineers in charge, F. M. Williams and H. E. Poole in 1906; J. R. Kaley and F. W. Hartwell in 1907.

Road No. 161 extends from the city line of Newburgh, northwesterly to the Ulster county line, connecting with the proposed system of improved highways through Ulster county. Local stone was used from Station 0+0 to Station 191+0, and from station 191+0 to station 454+78 the wearing surface was changed from gravel (which was originally contemplated) to local stone and shale.

Brunswick Turnpike Road, No. 227, Rensselaer County.

Engineer's preliminary estimate of total cost, including engi-

Length, 3.1 miles.

Width of macadam, 14 feet.

neering, $30,700.

Contract dated, July 9, 1906.

Work commenced, August, 1906.

Work completed, 78 per cent.

Contractor, Corliss Construction Company.

Engineers in charge, J. T. Brady and H. P. Condon.

Road No. 227 connects the village of Eagle Mills with the city of Troy. Local stone is being used to form the bottom course while trap-rock is being used to form the middle and top courses with local stone screenings as a binder.

Saugerties–Kingston Road, No. 228, Ulster County.

Length, 5.66 miles.

Width of macadam, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $55,700.

Contract dated, June 29, 1906.

Work commenced, August, 1906.

Work completed, 97 per cent.

Contractor, John E. Consaulus.

Engineer in charge, H. C. Titus.

Road No. 228 runs southerly from Saugerties to Chas. Hubscher's hotel in the towns of Saugerties and Ulster. Local stone is being used for bottom and top courses, including local stone screenings for binder.

KINGSTON–HIGH FALLS ROAD, NO. 229, ULSTER COUNTY.

Length, 6.93 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $82,300.

Contract dated, October 1, 1906.

Work not started.

Contractor, Stewart–Kerbaugh–Shanley Co.

Road No. 229 extends from the city line of Kingston southerly to the eastern corporation line of Rosendale, and from the bridge over the D. & H. canal to the town line of Marbletown, in the towns of Ulster and Rosendale. The contract calls for the use of local stone for both courses of this road.

KINGSTON–ELLENVILLE (SECTION 1) ROAD, NO. 230, ULSTER COUNTY.

Length, 8.27 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $88,200.

Contract dated, July 11, 1906.

Work commenced, September, 1907.

Work completed, 19 per cent.

Contractor, Joseph Walker.

Engineers in charge, J. R. Kaley and C. C. Ahles.

Road No. 230 extends from the Rochester town line through the village of Stone Ridge to the Hurley town line in the town of Marbletown. Local stone is being used to form the bottom and top courses, with local stone screenings for binder.

POST (SECTION 1) ROAD, NO. 231, ULSTER COUNTY.

Length, 7.08 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $71,100.

Contract dated, July 7, 1906.

Work commenced, August, 1906.

Work completed, 74 per cent.

Contractors, McNamee and Rice.

Engineers in charge, A. C. Perkins, J. R. Kaley and A. W. Smith.

Road No. 231 extends from the town line of Esopus to the town line of Marlborough in the town of Lloyd. Local stone is being used to form the bottom and top courses with local stone screenings for binder.

FRANKFORT–EAST SCHUYLER ROAD, No. 233, HERKIMER COUNTY.

Length, 1.64 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $14,300.

Contract dated, July 9, 1906.

Work commenced, August, 1906.

Work completed, 97 per cent.

Contractor, The Clinton Beckwith Engineering and Contracting Co.

Engineers in charge, O. J. Dempster, in 1906; E. A. Lamb, F. J. Mulvaney and T. J. Schoenlaub, in 1907.

Road No. 233 extends from the railroad freighthouse at Frankfort, westerly to the Bridenbecker creek cross-road in the town of Schuyler. Local stone is being used for bottom course of this road with sand filler; trap-rock is being used for middle and top courses with screenings for binder.

DELHI–MIDDLETOWN ROAD, No. 239, DELAWARE COUNTY.

Length, 4.96 miles.

Width of macadam, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $53,300.

Contract dated, August 30, 1906.

Work commenced, October, 1906.

Work completed, 74 per cent.

Contractor, Morris Kantrowitz.

Engineer in charge, E. C. Hackett.

Road No. 239 extends from State Road, No. 36, westerly to Margaretville in the town of Middletown. Local stone is being used in bottom and top courses of this road.

COHOES–WATERFORD ROAD, NO. 240, SARATOGA COUNTY.

Length, 1 mile.

Width of paving, 35 feet.

Engineer's preliminary estimate of total cost, including engineering, $24,432.41.

Contract dated, July 3, 1906.

Work commenced, August, 1906.

Work completed, 55 per cent.

Contractor, John W. Flynn.

Engineers in charge, Ralph Russell and R. Hopkins.

Road No. 240 extends from the Mohawk river bridge to town of Waterford. This road is to be vitrified brick pavement laid on 6-inch concrete foundation with a sand cushion; and a concrete gutter and curb on either side.

The United Traction Company operates a double track trolley line on this street and pays for 20 feet of pavement for the entire length.

SARATOGA–BALLSTON ROAD, NO. 241, SARATOGA COUNTY.

Length, 4.335 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $40,370.

Contract dated, July 13, 1906.

Work commenced, November, 1906.

Work completed, 46 per cent.

Contractor, Schenectady Contracting Co.

Engineers in charge, E. A. Lamb, C. R. Allen, Jr. and W. S. McLachlin.

Road No. 241 connects the villages of Saratoga Springs and Ballston Spa. Local stone with sand filler for bottom course, and trap-rock for middle and top courses, including screenings for binder, are being used.

SARATOGA–GLENS FALLS (SECTION 2) ROAD, NO. 242, SARATOGA COUNTY.

Length, 1.25 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $9,820.

Contract dated, July 13, 1906.

Work commenced, May, 1907.

Work completed, 96 per cent.

Contractor, Saratoga Trap-Rock Co.

Engineers in charge, E. A. Lamb, C. R. Allen, Jr. and H. E. Blake.

Road No. 242 extends from the east line of the town of Greenfield, northerly in the town of Wilton. Local stone with sand filler is being used for bottom course, and trap-rock for middle and top courses, including screenings for binder.

MECHANICVILLE–STILLWATER ROAD, NO. 243, SARATOGA COUNTY.

Length, 1.84 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $21,300.

Contract dated, July 9, 1906.

Work commenced, September, 1906.

Work completed, 10 per cent.

Contractor, The Clinton Beckwith Engineering and Contracting Co.

Engineers in charge, Ralph Russell, E. A. Lamb, C. R. Allen, Jr. and G. A. Ensign.

Road No. 243 connects the villages of Mechanicville and Stillwater. Local stone is being used for bottom course of this road. Trap-rock is being used for middle and top courses with screenings for binder.

SARATOGA-SCHUYLERVILLE ROAD, NO. 244, SARATOGA COUNTY.

Length, 6.01 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $59,550.

Contract dated, July 9, 1906.

Work commenced, August, 1906.

Work completed, 54 per cent.

Contractor, The Clinton Beckwith Engineering and Contracting Co.

Engineers in charge, Ralph Russell, E. A. Lamb, C. R. Allen, Jr. and A. J. Kaufman.

Road No. 244 extends from the village line of Schuylerville, westerly to the town line of Saratoga Springs. Approved stone is being used to form the bottom course and trap-rock for the middle and top courses, including stone screenings for binder.

GLOVERSVILLE-MECO-PHELPS ROAD, NO. 246, FULTON COUNTY.

Length, 2.03 miles.

Width of macadam, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $21,000.

Contract dated, July 12, 1906.

Work commenced, August, 1906.

Work completed, 93 per cent.

Contractor, Robert Shafer.

Engineers in charge, Lee Walker, E. A. Lamb, R. J. Murray and Geo. R. Halpin.

Road No. 246 consists of two sections. The Gloversville-Meco section connects Meco with the city of Gloversville. The Phelps section connects Talmadge Parson corners with the city of Gloversville. Approved stone is being used for all three courses of this road, with stone screenings for binder for the middle and top courses.

JOHNSTOWN-KECK'S CENTER (SECTION 2) ROAD, NO. 247, FULTON COUNTY.

Length, 4.67 miles.

Width of macadam, 12 and 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $47,100.

Contract dated, July 9, 1906.

Work commenced, April, 1907.

Work completed, 46 per cent.

Contractor, Clinton Beckwith Engineering and Contracting Co.

Engineers in charge, E. A. Lamb, R. J. Murray and Wm. R. Trumbull.

Road No. 247 extends from State Road, No. 110, westerly to the Old Fonda and Wheelerville plank road; and the Warren Creek–Red Schoolhouse section extends from the end of State Road, No. 109, at Warren Creek, westerly, to the road forks near the Red schoolhouse. Local stone is being used for all three courses of this road.

GLOVERSVILLE–BROADALBIN ROAD, NO. 248, FULTON COUNTY.

Length, 2.02 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $22,300.

Contract dated, September 1, 1906.

Work commenced, August, 1907.

Work completed, 25 per cent.

Contractor, Schenectady Contracting Co.

Engineers in charge, E. A. Lamb, R. J. Murray and Geo. R. Halpin.

Road No. 248 extends from the Mayfield road at Dennies Crossing, easterly to the F. J. & G. R. R. crossing. Local stone is being used for all three courses of this road.

PLATTSBURG–KEESEVILLE (SECTION 3) ROAD, NO. 258, CLINTON COUNTY.

Length, 5.44 miles.

Width of macadam, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $56,700.

Contract dated, July 9, 1906.

Work commenced, April, 1907.

Work completed, 98 per cent.

Contractor, The Clinton Beckwith Engineering and Contracting Co.

Engineers in charge, A. G. Chapman and H. J. Langlois.

Road No. 258 is a continuation of State Road, No. 137, and extends southerly from the village of Peru to the village of Keeseville. Local stone is being used for all three courses of this road.

PLATTSBURG–MOOERS (SECTION 2) ROAD, No. 259, CLINTON COUNTY.

Length, 7.34 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $75,170.

Contract dated, July 6, 1906.

Work commenced, August, 1906.

Work completed, 97 per cent.

Contractor, The Buckley Construction Company.

Engineers in charge, Frank L. Bisbee and H. J. Langlois.

Road No. 259 extends from the city of Plattsburg, northerly through East Beekmantown to the southern end of State Road, No. 138. Local stone is being used for the bottom course of this road, and limestone is being used for the top course with screenings for binder.

PLATTSBURG–MOOERS (SECTION 3) ROAD, No. 260, CLINTON COUNTY.

Length, 4.31 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $43,660.

Contract dated, August 1, 1906.

Work commenced, September, 1906.

Work completed, 44 per cent.

Contractor, The Buckley Construction Company.

Engineers in charge, H. J. Langlois and C. H. Chilvers.

Road No. 260 extends from the northerly end of State Road, No. 138, to the village of Mooers. Local stone is being used for bottom and top courses of this road.

PEEKSKILL–SALEM CENTRE (SECTION 1) ROAD, No. 261, WESTCHESTER COUNTY.

Length, 5.86 miles.

Width of macadam, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $50,150.

Contract dated, July 6, 1906.

Work commenced, August, 1907.

Work completed, 17 per cent.

Contractor, The Scofield Company.

Engineers in charge, J. R. Kaley, Perry Filkin and J. T. O'Hora.

Road No. 261 extends from State Road, No. 149, at the north end of Amawalk reservoir through Somers Centre and Somers to the Croton river. Local stone is being used for all three courses of this road.

PEEKSKILL–SALEM CENTRE (SECTION 2) ROAD, No. 262, WESTCHESTER COUNTY.

Length, 4.66 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $41,250.

Contract dated, July 6, 1906.

Work commenced, August, 1906.

Work completed, 94 per cent.

Contractor, The Scofield Company.

Engineers in charge, Perry Filkin, John T. O'Hora and J. R. Kaley.

Road No. 262 extends from the Croton river, easterly through Purdy, around the north side of Titicus reservoir and through Salem Centre, connecting with State road, No. 151, at the Titicus river crossing. Local stone is being used for all three courses of this road.

LAKE PLEASANT–SPECULATOR ROAD, No. 277, HAMILTON COUNTY.

Length, 3.44 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $33,900.

Contract dated, July 12, 1906.

Work commenced, August, 1906.

Work completed, 17 per cent.

Contractor, Robert Shafer.

Engineers in charge, Carl Ahles and Harry W. Peck, in 1906; E. A. Lamb, F. Edwards and Geo. Blauvelt, in 1907.

Road No. 277 extends from the Lake Pleasant inn, northeasterly to the highway intersection in Speculator. Local stone is being used for all three courses of this road.

GREENVILLE–SLATE HILL ROAD, NO. 282, ORANGE COUNTY.

Length, 7.13 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $65,900.

Contract dated, August 30, 1906.

Work commenced, October, 1906.

Work completed, 49 per cent.

Contractors, DeGraff and Hogeboom.

Engineers in charge, J. R. Kaley, R. D. Hayes and E. A. Faille.

Road No. 282 connects the villages of Greenville and Slate Hill. Local stone is being used for all three courses of this road.

GREENVILLE–PORT JERVIS ROAD, NO. 283, ORANGE COUNTY.

Length, 5.11 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $72,000.

Contract dated, September 4, 1906.

Work commenced, November, 1906.

Work completed, 31 per cent.

Engineers in charge, J. R. Kaley and R. D. Hayes.

Contractor, The Orange County Road Construction Co.

Road No. 283 connects the villages of Greenville and Port Jervis. Local stone is being used for all three courses of this road.

AVERILL PARK–CROOKED LAKE ROAD, NO. 284, RENSSELAER COUNTY.

Length, 3.61 miles.

Width of macadam, 14, 16 and 20 feet.

Engineer's preliminary estimate of total cost, including engineering, $37,440.

Contract dated, July 2, 1906.

Work commenced, August, 1906.

Work completed, 77 per cent.

Contractor, Martin Murray.

Engineers in charge, James T. Brady, C. F. Crowley and Leroy J. McCarthy.

Road No. 284 is a continuation of State Road, No. 194, in Averill Park and extends southerly through the villages of Sand Lake and Glasshouse to the Nassau town line. Local stone is being used for all three courses of this road.

NASSAU–BRAINARD ROAD, NO. 285, RENSSELAER COUNTY.

Length, 3.65 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $34,900.

Contract dated, July 7, 1906.

Work commenced, August, 1906.

Work completed, 88 per cent.

Contractor, Thomas H. Karr.

Engineer in charge, F. B. Morss.

Road No. 285 extends from the village of Nassau, easterly for a distance of 3.65 miles. Local stone is being used for ali three courses of this road.

RENSSELAER–BEST ROAD, NO. 287, RENSSELAER COUNTY.

Length, 4.75 miles.

Width of macadam, 12 feet, except through De Freestville, where it is 20 feet wide.

Engineer's preliminary estimate of total cost, including engineering, $43,750.

Contract dated, August 30, 1906.

Work commenced, October, 1906.

Work completed, 81 per cent.

Contractor, Morris Kantrowitz.

Engineer in charge, F. B. Morss.

Road No. 287 extends from the city line of Rensselaer, southeasterly through De Freestville and Best to the town line of Sand Lake. Local stone is being used for all three courses of this road.

CRESCENT AVENUE ROAD, NO. 289, SUFFOLK COUNTY.

Length, 1.91 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $23,200.

Contract dated, September 3, 1907.

Work not started.

Contractors, E. M. and W. Ferguson.

Road No. 289 is located on Fisher's Island and extends from the property of Robert P. Linderman northeasterly to West Harbor near the Munnatawket dock. The contract calls for the use of approved stone with sand filler for bottom course and trap-rock for the top including trap-rock screenings for a binder.

AMSTERDAM–HAGAMAN ROAD, NO. 298, MONTGOMERY COUNTY.

Length, 2.20 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $19,400.

Contract dated, July 9, 1906.

Work commenced, August, 1907.

Work completed, 10 per cent.

Contractor, The Clinton Beckwith Engineering and Contracting Co.

Engineers in charge, E. A. Lamb, J. B. Wright and C. R. DeGraff.

Road No. 298 connects the village of Hagaman with the city of Amsterdam. Local stone is being used for bottom and top courses of this road.

SAULWATER'S CORNERS–YOUNG'S CORNERS ROAD, No. 299, MONTGOMERY COUNTY.

Length, 2.77 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $29,100.

Contract dated, July 11, 1906.

Work commenced, April, 1907.

Work completed, 92 per cent.

Contractor, Joseph Walker.

Engineers in charge, E. A. Lamb, J. B. Wright and Glen Bates.

Road No. 299 extends from State Road, No. 32, southwesterly to the corner near the property of James A. Young. Local stone is being used for bottom and top courses of this road.

FONDA–TRIBES HILL ROAD, No. 303, MONTGOMERY COUNTY.

Length, 2.21 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $20,900.

Contract dated, September 3, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 303 extends from State Road, No. 152, easterly to State Road, No. 108.

The contract calls for the use of approved stone with sand filler for the bottom course and trap-rock, granite or gneiss for the top course including trap-rock, granite or gneiss screenings for a binder.

SPRAKERS–RURAL GROVE ROAD, No. 304, MONTGOMERY COUNTY.

Length, 5.66 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $59,600.

Contract dated, September 3, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 304 extends from the town line of Canajoharie, easterly through Sprakers and Currytown to Rural Grove. The contract calls for the use of approved stone with sand filler for the bottom course and approved stone for the top course, including approved stone screenings for a binder.

KINGSTON–ELLENVILLE (SECTION 2) ROAD, NO. 305, ULSTER COUNTY.

Length, 7.25 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $71,725.

Contract dated, July 3, 1906.

Work commenced, September, 1906.

Work completed, 46 per cent.

Contractor, Town of Rochester.

Engineers in charge, A. C. Perkins, J. R. Kaley and C. C. Ables.

Road No. 305 extends from the town line of Wawarsing, northeasterly to the town line of Marbletown. Local stone is being used for the two courses of this road.

KINGSTON–ULSTER LANDING ROAD, NO. 306, ULSTER COUNTY.

Length, 5.564 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $58,100.

Contract dated, September 3, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 306 extends from the city line of Kingston northerly to the town line of Saugerties.

The contract calls for the use of approved stone with sand filler for the bottom course and trap-rock for the top course including trap-rock screenings for a binder.

PLATTEKILL–MODENA ROAD, NO. 307, ULSTER COUNTY.

Length, 7.16 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $73,100.

Contract dated, September 3, 1907.

Work not started.

Contractor, Joseph Walker.

Road No. 307 extends from the Orange County line northerly through Plattekill, Sylva and Modena, to the town line of Gardiner. The contract calls for the use of approved stone with sand filler for the bottom course and approved stone for the top course, including limestone screenings for a binder.

MIDDLETOWN–CUDDEBACKVILLE (SECTION 1) ROAD, NO. 312, ORANGE COUNTY.

Length, 4.396 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $42,100.

Contract dated, September 4, 1906.

Work commenced, November, 1906.

Work completed, 54 per cent.

Contractor, The Orange County Road Construction Co.

Engineers in charge, John R. Kaley and R. D. Hayes.

Road No. 312 extends from the city line of Middleton, westerly to Station 259+35.3 near Pierson's crossing in the towns of Wallkill and Mount Hope. Local stone is being used for all three courses of this road.

MIDDLETOWN–CUDDEBACKVILLE (SECTION 2) ROAD NO. 313, ORANGE COUNTY.

Length, 5.18 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $56,950.

Contract dated, September 3, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 313 extends from Station 117+65, Road No. 312, to the village line of Cuddebackville. The contract calls for the use of approved stone in both courses of this road.

GILBERTSVILLE–MT. UPTON ROAD, NO. 314, OTSEGO COUNTY.

Length, 4.37 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $46,900.

Contract dated, June 30, 1906.

Work commenced, April, 1907.

Work completed, 47 per cent.

Contractor, S. B. Van Wagonen.

Engineers in charge, J. C. Patrick and J. S. Greenough.

Road No. 314 extends from the village of Gilbertsville, southwesterly to the Unadilla River bridge at Mt. Upton in the town of Butternuts. Local stone is being used for bottom and top courses of this road.

MORRIS–GILBERTSVILLE (SECTION 1) ROAD, NO. 315, OTSEGO COUNTY.

Length, 3.537 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $32,700.

Contract dated, July 9, 1906.

Work commenced, August, 1906.

Work completed, 79 per cent.

Contractor, The Clinton Beckwith Engineering and Contracting Co.

Engineers in charge, J. C. Patrick and A. J. Muench.

Road No. 315 extends from the village line of Morris, southeasterly to the town line of Butternuts. Local stone is being used on both courses of this road.

SHADY SIDE–OTEGO ROAD, NO. 317, OTSEGO COUNTY.

Length, 2.73 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $26,200.

Contract dated, July 10, 1906.

Work commenced, October, 1906.

Work completed, 57 per cent.

Contractors, Siver and Gould.

Engineers in charge, J. C. Patrick and J. A. O'Donnell, in 1906; J. C. Patrick and Wm. M. Payne, in 1907.

Road No. 317 extends from the corners at Shady Side, southwesterly to the town line of Otego. The contract called for the use of local stone for both courses of this road but on account of the heavy traffic was changed by agreement as follows: Richfield limestone from Sta. 0+00 to 38+67 for bottom and top with limestone screenings as a filler, and local quarry stone with local screenings for bottom and Fort Ann and Saratoga trap-rock with a mixture of trap and limestone screenings for the top course from Sta. 38+67 to the end of road.

SCHENEVUS–MARYLAND ROAD, NO. 319, OTSEGO COUNTY.

Length, 3.66 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $41,300.

Contract dated, June 30, 1906.

Work commenced, July, 1906.

Work completed, 97 per cent.

Contractor, S. B. Van Wagonen.

Engineers in charge, J. C. Patrick and M. C. Barker.

Road No. 319 extends from the village of Schenevus, westerly through Chaseville and Maryland to the Maryland cemetery. Limestone is being used for the two courses of this road.

PEEKSKILL–SALEM CENTER (SECTION 3) ROAD, NO. 331, WESTCHESTER COUNTY.

Length, 3.88 miles.

Width of macadam, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $47,800.

Contract dated, July 20, 1906.

Work commenced, October, 1906.

Work completed, 30 per cent.

Contractor, Orange County Road Construction Co.

Engineers in charge, J. R. Kaley, Perry Filkin, C. H. Chilvers and F. E. Reed.

Road No. 331 extends from the village of Peekskill, easterly to the foot of the hill near the property of E. Tice in the towns of Cortland and Yorktown. Local stone is being used for all three courses of this road.

PEEKSKILL–SALEM CENTER (SECTION 4) ROAD, NO. 332, WESTCHESTER COUNTY.

Length, 3.23 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $39,650.

Contract dated, July 20, 1906.

Work commenced, May, 1907.

Work completed, 48 per cent.

Contractor, Orange County Road Construction Co.

Engineers in charge, J. R. Kaley, Perry Filkin, F. A. *Biggi.*

Road No. 332 is a continuation of State Road, No. 331, from the foot of the hill near the property of E. Tice, easterly through the village of Yorktown to State Road, No. 149, near the property of C. Whitney in the town of Yorktown. Local stone is being used for all three courses of this road.

SARATOGA–CORINTH ROAD, NO. 340, SARATOGA COUNTY.

Length, 7.25 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $63,500.

Contract dated, July 6, 1906.

Work commenced, April, 1907.

Work completed, 57 per cent.

Contractor, Buckley Construction Co.

Engineers in charge, E. A. Lamb, C. R. Allen, Jr., Arthur C. Eaton and H. S. Mattimore.

Road No. 340 extends from the north town line of Saratoga Springs through the villages of Greenfield Center and North Greenfield to the Corinth town line in the town of Greenfield. Local stone is being used for bottom course of this road; traprock for middle and top courses, with limestone screenings for binder.

STOCKPORT-HUDSON ROAD, No. 341, COLUMBIA COUNTY.

Length, 2.60 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $30,150.

Contract dated, July 6, 1906.

Work commenced, July, 1906.

Work completed, 69 per cent.

Contractor, John W. Polcaro.

Engineers in charge, R. J. Harding and H. K. Bishop, in 1906; J. R. Kaley and E. W. Sylvester, in 1907.

Road No. 341 extends from the city line of Hudson, northerly to the southerly line of the town of Stockport. Local stone is being used for bottom and middle courses of this road, and traprock for top course with screenings for binder.

CHATHAM–CHATHAM CENTER ROAD, No. 342, COLUMBIA COUNTY.

Length, 1.12 miles.

Width of gravel, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $8,700.

Contract dated, August 28, 1906.

Work commenced, May, 1907.

Work completed, 52 per cent.

Contractor, John W. Polcaro.

Engineers in charge, J. R. Kaley, E. W. Sylvester and R. P. Campfield.

Road No. 342 extends from the residence of Daniel Angel, northerly to the north end of Sutherland's hill in the town of Chatham. Gravel is being used in the construction of this road.

FRANKFORT-UTICA (SECTION 2) ROAD, No. 359, HERKIMER COUNTY.

Length, 1.89 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $18,700.

Contract dated, July 10, 1906.

Work commenced, August, 1906.

Work completed, 77 per cent.

Contractor, Charles R. Lewis.

Engineers in charge, O. J. Dempster, in 1906; E. A. Lamb, F. J. Mulvaney and J. D. Rutledge, in 1907.

Road No. 359 extends from a point 1.11 miles west of the village line of Frankfort to a point 3 miles west of Frankfort. Approved local stone with sand filler is being used for bottom course of this road, and trap-rock, granite or gneiss for middle and top courses, including binder.

JOHNSTOWN-TRIBES HILL (SECTION 1) ROAD, No. 361, FULTON COUNTY.

Length, 2.22 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $24,000.

Contract dated, July 9, 1906.

Work commenced, August, 1906.

Work completed, 93 per cent.

Contractor, Ulysses G. Stockwell.

Engineers in charge, H. C. Wells, R. J. Murray and E A. Lamb.

Road No. 361 extends from the city line of Johnstown on East State street easterly to the Montgomery county line. Local stone is being used for all three courses of this road.

NORTHVILLE–CHAPMAN'S CORNERS ROAD, NO. 362, FULTON COUNTY.

Length, 1.71 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $16,900.

Contract dated, September 3, 1907.

Work not started.

Contractor, Alonzo Schaupp.

Road No. 362 extends from the Sacandaga river bridge at Northville southerly through Sacandaga Park to the corners near the property of Andrew Chapman. The contract calls for the use of approved stone with sand filler for the bottom course and trap-rock, granite or gneiss for the top course including trap-rock, granite or gneiss screenings for a binder.

MAYFIELD–NORTHVILLE (SECTION 1) ROAD, NO. 363, FULTON COUNTY.

Length, 1.37 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $12,000.

Contract dated, September 3, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 363 extends from the village line of Mayfield northeasterly to the arch culvert near the property of Dennie Brothers. The contract calls for the use of approved stone with sand filler for the bottom course and approved stone for the top course including limestone screenings for a binder.

PRESTON HOLLOW–POTTER HOLLOW ROAD, NO. 364, ALBANY COUNTY.

Length, 3.13 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $27,400.

Contract dated, July 12, 1906.

Work commenced, September, 1906.

Work completed, 43 per cent.

Contractor, Robert Shafer.

Engineers in charge, Ludlow L. Melius and George A. Flynn.

Road No. 364 extends from the Cheese Hill road in Preston Hollow southwesterly through Cooksburg to the highway in intersection in Potter Hollow. Approved local stone is being used for all three courses of this road.

GLOVERSVILLE–BULL RUN ROAD, NO. 376, FULTON COUNTY.

Length, 2.38 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $25,400.

Contract dated, September 3, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 376 extends from the city line of Gloversville at Bleecker street northwesterly to the bridge at the foot of the hill in Bull Run. The contract calls for the use of approved stone with sand filler for the bottom course and approved stone for the top course including approved stone screenings for a binder.

ALBANY–SCHENECTADY (SECTION 2) ROAD, NO. 385, ALBANY COUNTY.

Length, 5.14 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $63,500.

Contract dated, September 3, 1907.

Work not started.

Contractor, Robertson and Gerehart Construction Co.

Road No. 385 extends from State Road, No. 176, at Wolf Road northwesterly to State Road, No. 179, at the Schenectady county line. The contract calls for the use of trap-rock, granite or gneiss with sand or screenings as a filler for the bottom course and trap-rock, granite or gneiss for the top course including trap-rock, granite or gneiss screenings for a binder.

KITCHAWAN–CROTON LAKE ROAD, NO. 405, WESTCHESTER COUNTY.

Length, 2.25 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $17,125.

Contract dated, September 4, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 405 extends from State Road, No. 143, at Kitchawan northerly to State Road, No. 148, at Croton lake. The contract calls for the use of approved stone with sand filler for the bottom course and trap-rock for the top course including trap-rock screenings for a binder.

TROY–SCHENECTADY (SECTION 2) ROAD, NO. 407, SCHENECTADY COUNTY.

Length, 3.025 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $37,400.

Contract dated, September 4, 1907.

Work not started.

Contractors, Malloy and Davis.

Road No. 407 extends from State Road, No. 1, southeasterly to the Albany county line. The contract calls for the use of trap-rock, granite or gneiss with sand or screenings as a filler for the bottom course and trap-rock, granite or gneiss for the top course including trap-rock, granite or gneiss screenings for a binder.

GLENS FALLS–LAKE GEORGE ROAD, NO. 417, WARREN COUNTY.

Length, 7.56 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $84,700.

Contract dated, July 10, 1906.

Work commenced, August, 1906.

Work completed, 78 per cent.

Contractors, Casey and Murray.

Engineer in charge, Orson C. Richards.

Road No. 417 extends from the corporation line of the village of Glens Falls, northwesterly and northerly to the southerly corporation line of the village of Lake George. Local stone is being used for bottom course of this road, with sand for filler; traprock for middle and top courses with screenings for binder.

LAKE GEORGE–BOLTON LANDING ROAD, NO. 418, WARREN COUNTY.

Length, 9.74 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $108,875.

Contract dated, July 10, 1906.

Work commenced, April, 1907.

Work completed, 82 per cent.

Contractors, Casey and Murray.

Engineer in charge, Orson C. Richards.

Road No. 418 extends from the corporation line of the village of Lake George, northerly through the village of Bolton Landing to the bridge over Finkle brook. Local stone is being used for all three courses of this road.

RHINEBECK–HYDE PARK ROAD, NO. 432, DUTCHESS COUNTY.

Length, 3.26 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $37,725.

Contract dated, August 31, 1906.

Work commenced, September, 1906.

Work completed, 55 per cent.

Contractors, Lawlor and Haines.

Engineers in charge, J. R. Kaley and N. A. Taylor.

Road No. 432 extends from the village line of Rhinebeck, southerly to the Hyde Park town line. Local stone is being used for all three courses of this road.

CHAZY–CHAZY LANDING–OBER'S CORNERS ROAD, NO. 433, CLINTON COUNTY.

Length, 4.60 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $38,925.

Contract dated, September 1, 1906.

Work commenced, September, 1907.

Work completed, 3 per cent.

Contractor, Buckley Construction Company.

Engineer in charge, H. J. Langlois.

Road No. 433 extends from the D. & H. R. R. in the village of Chazy, southeasterly to the road leading to the dock in the village of Chazy Landing, and from State Road, No. 138, at Ober's Corners easterly through Sciota to the road leading to Mooers. The contract calls for the use of local stone for all three courses of this road.

JERICHO TURNPIKE–PLAINVIEW ROAD, NO. 436, NASSAU COUNTY.

Length, 6.98 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $80,950.

Contract dated, September 1, 1906.

Work commenced, April, 1907.

Work completed, 93 per cent.

Contractor, Jeremiah T. Finch.

Engineers in charge, J. R. Kaley, Jas. L. Chapman, Jas. Sturdevant and F. J. Kinney.

Road No. 436 extends from the macadam road at Jericho, northeasterly to the Suffolk county line, and from the Woodbury–Hicksville macadam road, southeasterly to the Farmingdale–Plainview macadam road. The contract calls for the use of approved stone for bottom course of this road, and trap-rock for middle and top courses.

JERUSALEM AVENUE–FRONT STREET ROAD, NO. 437, NASSAU COUNTY.

Length, 7.09 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $81,000.

Contract dated, September 4, 1907.

Work not started.

Contractor, Russell Contracting Co.

Road No. 437 extends from the Billmore avenue road easterly to the Hicksville macadam road, and from the village line of Hemstead northeasterly to the Bethpage turnpike. The contract calls for the use of trap-rock with sand filler for the bottom course and trap-rock for the top course including trap-rock screenings for a binder.

EAST NASSAU–BRAINARD ROAD, NO. 439, RENSSELAER COUNTY.

Length, 3.78 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $42,000.

Contract dated, September 4, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 439 extends from the southerly end of State Road, No. 196, southerly through the village of East Nassau and then westerly through the village of Brainard to the westerly end of State Road, No. 285, and southerly to Brainard Station. The contract calls for the use of approved stone with sand filler for the bottom course and approved stone for the top course including approved stone screenings for a binder.

SARATOGA–GLENS FALLS (SECTIONS 4 AND 5) ROAD, NO. 441, SARATOGA COUNTY.

Length, 8.32 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $74,700.

Contract dated, August 31, 1906.

Work commenced, May, 1907.

Work completed, 58 per cent.

Contractor, The Clinton Beckwith Engineering and Contracting Co.

Engineers in charge, E. A. Lamb, C. R. Allen, Jr. and H. E. Blake.

Road No. 441 extends from State Road, No. 242, northerly through the village of Wilton to State Road, No. 58, at the town line of Moreau and from the village line of South Glens Falls, southwesterly to State Road, No. 58. Local stone is being used for the two courses of this road.

SARATOGA–GANSEVOORT ROAD, No. 442, SARATOGA COUNTY.

Length, 6.14 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $45,700.

Contract dated, September 4, 1907.

Work not started.

Contractor, Morris Kantrowitz.

Road No. 442 extends from the town line of Saratoga Springs northeasterly to the town line of Northumberland. The contract calls for the use of approved stone with sand filler for the bottom course and trap-rock for the top course including trap-rock screenings for a binder.

SARATOGA–GREENFIELD–SCHUYLERVILLE–GLENS FALLS ROAD, No. 443, SARATOGA COUNTY.

Length, 6.28 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $60,300.

Contract dated, September 4, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 443 extends from the village line of Saratoga Springs in Waring avenue northwesterly to State Road, No. 340, at the town line of Greenfield and from the village line of Saratoga Springs easterly to the town line of Saratoga and from the village line of Saratoga Springs northerly to State Road, No. 242, at the town line of Wilton. The contract calls for the use of approved stone with sand filler for the bottom course and trap-rock for the top course including trap-rock screenings for a binder.

POUGHKEEPSIE–HYDE PARK ROAD, No. 453, DUTCHESS COUNTY.

Length, 4 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $52,450.

Contract dated, July 10, 1906.

Work commenced November, 1906.

Work completed, 2 per cent.

Contractors, McNamee and Rice.

Engineers in charge, J. R. Kaley and N. A. Taylor.

Road No. 453 extends from the Poughkeepsie-Hyde Park town line, northerly to the south line of the property of F. W. Vanderbilt in the village of Hyde Park. Local stone is being used for bottom course of this road, and trap-rock for middle and top courses.

LITTLE FALLS–EAST CREEK ROAD, No. 456, HERKIMER COUNTY.

Length, 5.39 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $61,500.

Contract dated, July 19, 1906.

Work commenced, September, 1906.

Work completed, 41 per cent.

Contractor, Ulysses G. Stockwell.

Engineers in charge, O. J. Dempster, in 1906; E. A. Lamb, F. J. Mulvaney and W. E. Petty, in 1907.

Road No. 456 extends from the city line of Little Falls, easterly along the north side of the Mohawk river to the Montgomery county line at East Creek. Trap-rock is being used for bottom course of this road, and gneiss for middle and top courses.

LITTLE FALLS–HERKIMER ROAD, No. 457, HERKIMER COUNTY.

Length, 5.32 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $65,700.

Contract dated, July 9, 1906.

Work commenced, August, 1906.

Work completed, 49 per cent.

Contractor, Sylvester A. Seymour.

Engineers in charge, O. J. Dempster, in 1906; E. A. Lamb, F. J. Mulvaney and W. D. Hildredth, in 1907.

Road No. 457 extends from the city line of Little Falls, westerly along the northerly side of the Mohawk river to the village line of Herkimer. Local stone is being used for bottom course of this road; trap-rock, granite or gneiss for middle and top courses.

HERKIMER–FRANKFORT ROAD, No. 458, HERKIMER COUNTY.

Length, 3.69 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $38,925.

Contract, dated July 10, 1906.

Work commenced, August, 1906.

Work completed, 48 per cent.

Contractor, John H. Nelson & Co.

Engineers in charge, O. J. Dempster, in 1906; E. A. Lamb, F. J. Mulvaney and H. E. Poole, in 1907.

Road No. 458 extends from the corporation line of the village of Herkimer, westerly along the northerly side of the Mohawk river to the easterly end of State Road, No. 233. Local stone is being used for bottom course of this road; trap-rock, granite or gneiss for middle and top courses.

EAST SCHUYLER–DEERFIELD ROAD, No. 459, HERKIMER COUNTY.

Length, 5.53 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $62,300.

Contract dated, July 9, 1906.

Work commenced, August, 1906.

Work completed, 22 per cent.

Contractor, The Clinton Beckwith Engineering & Contracting Co.

Engineers in charge, O. J. Dempster, in 1906; E. A. Lamb, F. J. Mulvaney and T. J. Schoenlaub, in 1907.

Road No. 459 extends from the end of State Road, No. 233, northwesterly through the village of West Schuyler to the end of State Road, No. 3, at the Oneida county line. Local stone is being used for the bottom course of this road; trap-rock, granite or gneiss for middle and top courses.

HERKIMER–MIDDLEVILLE ROAD, No. 460, HERKIMER COUNTY.

Length, 6.30 miles.

Width of macadam, 12, 14, 15 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $72,515.

Contract dated, July 10, 1906.

Work commenced, October, 1906.

Work completed, 17 per cent.

Contractor, John H. Nelson & Co.

Engineers in charge, E. A. Lamb, F. J. Mulvaney and F. C. Woodward.

Road No. 460 extends from the corporation line of the village of Herkimer, northerly along the West Canada creek to the corporation line of the village of Middleville. Local stone is being used for all three courses of this road.

AUSABLE FORKS–CLINTONVILLE ROAD, No. 476, CLINTON COUNTY.

Length, 5.38 miles.

Width of macadam, 14 and 22 feet.

Engineer's preliminary estimate of total cost, including engineering, $56,150.

Contract dated, August 31, 1906.

Work commenced, June, 1907.

Work completed, 56 per cent.

Contractor, The Clinton Beckwith Engineering & Contracting Co.

Engineers in charge, A. G. Chapman and F. N. Sanders.

Road No. 476 extends from the bridge over Ausable river in Ausable Forks village in the town of Black Rock to the intersection of Fulton street in the village of Clintonville. Local stone is being used for all three courses of this road.

SELKIRK–COEYMANS ROAD, NO. 508, ALBANY COUNTY.

Length, 4.77 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $41,000.

Contract dated, September 4, 1907.

Work not started.

Contractor, Robertson & Gerehart Construction Co.

Road No. 508 extends from State Road, No. 193, southerly through the village of Coeymans to the Greene county line. The contract calls for the use of approved stone with sand filler for the bottom course and trap-rock for the top course including trap-rock screenings for a binder.

MOUNT KISCO–PLEASANTVILLE ROAD NO. 519, WESTCHESTER COUNTY.

Length, 3.92 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $42,270.

Contract dated, September 4, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 519 extends from the corporation line of the village of Mount Kisco southwesterly to the corporation line of the village of Pleasantville. The contract calls for the use of approved stone with sand filler for the bottom course and approved stone for the top course including approved stone screenings for a binder.

PLEASANTVILLE–POCANTICO HILLS ROAD, NO. 520, WESTCHESTER COUNTY.

Length, 3.55 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $36,250.

Contract dated, September 4, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 520 extends from the corporation line of the village of Pleasantville, southwesterly to the Putnam division of the N. Y. C. & H. R. R., near Pocantico Hills. The contract calls for the use of approved stone with sand filler for the bottom course and approved stone for the top course including approved stone screenings for a binder.

WEST CHAZY–CHAZY ROAD, NO. 533, CLINTON COUNTY.

Length, 6.34 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $56,250.

Contract dated, September 5, 1907.

Work not started.

Contractor, Jeremiah T. Finch.

Road No. 533 extends from State Road, No. 138, in the village of West Chazy, northeasterly to the village of Chazy at a point about 2,100 feet southerly from the D. & H. railroad. The contract calls for the use of approved stone with sand filler for the bottom course and approved stone for the top course including limestone screenings for a binder.

AMENIA–WASSAIC ROAD, NO. 537, DUTCHESS COUNTY.

Length, 4.83 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $45,500.

Contract dated, July 7, 1906.

Work commenced, April, 1907.

Work completed, 74 per cent.

Contractor, General Construction Company.

Engineers in charge, J. R. Kaley, Perry Filkin and E. J. Howe.

Road No. 537 extends from the road leading to Sharon Station, southerly through the villages of Amenia and Wassaic to the road leading to South Amenia. Local stone is being used for the two courses of this road.

CHATHAM–SPENCERTOWN ROAD, NO. 540, COLUMBIA COUNTY.

Length, 4.32 miles.

Width of gravel, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $23,500.

Contract dated, July 6, 1906.

Work commenced, September, 1906.

Work completed, 71 per cent.

Contractor, John W. Polcaro.

Engineers in charge, R. J. Harding and H. K. Bishop, in 1906; J. R. Kaley, E. W. Sylvester and R. O. Hollenbeck, in 1907.

Road No. 540 extends from the corporation line of the village of Chatham, southeasterly toward the village of Spencertown to Station 163 near the property of T. F. Niles. Gravel is being used for the wearing surface of this road.

SYOSSET–COLD SPRING HARBOR ROAD, NO. 545, NASSAU COUNTY.

Length, 3.22 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $36,850.

Contract dated, September 5, 1907.

Work not started.

Contractor, Jeremiah T. Finch.

Road No. 545 extends from the Berry Hill road in the village of Syosset, northeasterly toward the village of Cold Spring Harbor to the road leading to Laurelton, about 1,200 feet from the Suffolk county line. The contract calls for the use of trap-rock with sand filler for the bottom course and trap-rock for the top course including trap-rock screenings for a binder.

POUGHKEEPSIE–PLEASANT VALLEY ROAD, No. 549, DUTCHESS COUNTY.

Length, 6.93 miles.

Width of macadam, 14, 16 and 20 feet.

Engineer's preliminary estimate of total cost, including engineering, $60,450.

Contract dated, July 5, 1906.

Work commenced, July, 1906.

Work completed, 55 per cent.

Contractor, James E. Martin.

Engineers in charge, N. A. Taylor and J. R. Kaley.

Road No. 549 extends from the Poughkeepsie city line, northeasterly to Station 275 near the corporation line of the village of Pleasant Valley; and from the forks of the roads near the lands of Eliza Baker, southeasterly to the bridge over Wappinger creek. Local stone is being used for the two courses of this road.

RHINEBECK–ELIZAVILLE ROAD, No. 552, DUTCHESS COUNTY.

Length, 5.54 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost. including engineering, $58,500.

Contract dated, September 5, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 552 extends from the corporation line of the village of Red Hook, northerly toward the village of Elizaville to the Columbia county line and from the Rhinebeck-Red Hook town line northerly to the corporation line of the village of Red Hook. The contract calls for the use of approved stone for both courses of this road.

MATTEAWAN–WICOPEE ROAD, NO. 567, DUTCHESS COUNTY.

Length, 4.71 miles.

Width of macadam, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $47,100.

Contract dated, September 5, 1907.

Work not started.

Contractor, The Lane Construction Corporation.

Road No. 567 extends from the corporation line of the village of Matteawan, northeasterly through the village of Glenham to the corporation line of the village of Fishkill and from the corporation line of the village of Fishkill easterly through the village of Brinkerhoff to the East Fishkill town line. The contract calls for the use of approved stone with sand filler for the bottom course and trap-rock for the top course including trap-rock screenings for a binder.

BALDWIN PLACE–MAHOPAC ROAD, NO. 569, PUTNAM COUNTY.

Length, 5.9 miles.

Width of macadam, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $51,500.

Contract dated, July 11, 1906.

Work commenced, August, 1906.

Work completed, 71 per cent.

Contractor, Joseph Walker.

Engineers in charge, John R. Kaley, Perry Filkin, C. R. Allen, Jr., Wm. Gordon and G. H. Harter.

Road No. 569 extends from the northerly end of State Road, No. 149, westerly, northerly and northeasterly through the village of Mahopac to the fork of the roads at the southwest corner of the West Branch reservoir. Local stone is being used for all three courses of this road.

CARMEL–KENT ROAD, NO. 570, PUTNAM COUNTY.

Length, 5.02 miles.

Width of macadam, 14, 16 and 22 feet.

Engineer's preliminary estimate of total cost, including engineering, $55,650.

Contract dated, September 5, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

Road No. 570 extends from the railroad station in the village of Carmel, northeasterly to the town line between Kent and Patterson near L. G. Robinson's. The contract calls for the use of approved stone in both courses of this road.

NEVIS–BLUE STORE ROAD, NO. 589, COLUMBIA COUNTY.

Length, 3.81 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $28,600.

Contract dated, September 1, 1906.

Work commenced, April, 1907.

Work completed, 43 per cent.

Contractor, Harry S. Williams.

Engineers in charge, J. R. Kaley, E. W. Sylvester and W. G. Craig.

Road No. 589 extends from State Road, No. 552, at the Dutchess county line, northerly through Nevis to the Roeliff Jansen Kill near the Blue Store. The contract calls for the use of local stone for the two courses of this road.

HIGHLAND LAKE–TOMPKINS COVE ROAD, NO. 593, ROCKLAND COUNTY.

Length, 5.88 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $105,650.

Contract dated, September 13, 1906.

Work commenced, January, 1907.

Work completed, 28 per cent.

Contractor, County of Rockland.

Engineers in charge, J. R. Kaley, A. C. Perkins and Wm. Hunt.

Road No. 593 extends from the Orange county line at Highland Lake, southerly along the Dunderberg Mt. to Tompkins Cove. Local stone is being used for all three courses of this road.

NEW LEBANON–BRAINARD ROAD, NO. 615, COLUMBIA COUNTY.

Length, 8.03 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $62,800.

Contract dated, September 5, 1907.

Work not started.

Contractors, Hinman and Sproul.

Road No. 615 extends from the bridge over Wyomanock creek, westerly through New Lebanon and West Lebanon to the Rensselaer county line near Brainard and from the bridge over Wyomanock creek, northeasterly and southeasterly to State Road, No. 4. The contract calls for the use of approved stone in both courses of this road.

ROTTERDAM JUNCTION–PA[illegible]NVILLE ROAD, NO. 640, SCHEN[illegible]UNTY.

L[illegible] miles.

[illegible]adam, 14 [illegible].

[illegible]reliminary [illegible] total cost, including engi-
ne[illegible]0.

[illegible]d, Septe[illegible]7.

[illegible]rted.

[illegible]Malloy [illegible]

[illegible]0 ext[illegible] Boston & Maine R. R. near
[illegible]ction [illegible] through the village of Pat-
[illegible]he M[illegible]unty line. The contract calls
[illegible] a[illegible] with sand filler for the bottom
[illegible]p-[illegible] gneiss for the top course includ-
[illegible] screenings for a binder.

SANDY HILL–GLENS FALLS ROAD, No. 656, WARREN COUNTY.

Length, 2.12 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $25,000.

Contract dated, September 5, 1907.

Work not started.

Contractors, Reardon and Byrne.

Road No. 656 extends from the Washington county line, westerly to the corporation line of the village of Glens Falls. The contract calls for the use of approved stone in both courses of this road.

IMPROVEMENT OF PUBLIC HIGHWAYS.

Recapitulation of Work done to September 30, 1907.

COUNTY.	Miles under contract during year ending Sept. 30, 1907.	Miles of plans and estimates completed prior to Sept. 30, 1906.	Miles of plans and estimates completed prior to Sept. 30, 1907.	Miles of plans and estimates completed during year ending Sept. 30, 1907.	Miles of surveys made during year ending Sept. 30, 1907.	Miles of contracts completed prior to Sept. 30, 1906.	Miles of contracts completed prior to Sept. 30, 1907.	Miles of contracts completed during year ending Sept. 30, 1907.
Albany	28.55	94.518	108.718	14.20	38.47	55.448	86.468	31.02
Clinton	33.41	56.25	65.07	8.82	59.61	17.66	17.66	......
Columbia	19.88	12.49	27.20	14.71	......	1.13	1.13	......
Delaware	4.96	15.054	15.054	......	5.91	4.52	4.52	......
Dutchess	41.83	42.571	57.021	14.45	5.00	10.643	30.303	19.66
Essex	2.64	2.64	13.06	10.42	22.90	......	2.64	2.64
Franklin	......	......	......	......	9.82	......	......	......
Fulton	19.54	50.25	75.40	25.15	25.96	8.59	11.73	3.14
Greene	......	5.62	5.62	......	46.08	......	......	......
Hamilton	3.44	3.44	3.44	......	26.82	......	......	......
Herkimer	30.11	108.30	118.84	10.54	11.85	2.29	2.64	0.35
Montgomery	19.01	106.904	112.674	5.77	12.32	22.164	33.654	11.49
Nassau	22.08	43.195	43.195	......	15.75	......	4.79	4.79
Orange	42.286	212.223	212.223	......	1.13	91.51	102.99	11.48
Otsego	17.587	21.137	40.337	19.20	55.19	3.55	6.84	3.29
Putnam	10.92	39.686	39.686	......	18.96	......	......	......
Rensselaer	30.22	107.99	110.24	2.25	21.91	32.84	50.79	17.95
Rockland	5.88	11.11	11.11	......	4.33	6.73	6.73	......
Saratoga	42.425	55.065	69.145	14.08	30.13	12.60	12.60	......
Schenectady	14.095	28.965	41.845	12.88	15.32	7.721	7.721	......
Suffolk	1.91	1.91	13.42	11.51	62.16	......	......	......
Sullivan	......	11.32	11.32	......	11.71	......	......	......
Ulster	47.914	151.185	167.025	15.84	......	44.11	49.77	5.66
Warren	19.42	17.30	29.29	11.99	6.24	......	......	......
Washington	......	8.77	33.42	24.65	13.44	7.09	7.09	......
Westchester	33.34	99.45	105.46	6.01	10.00	55.00	60.99	5.99
Totals	491.447	1,307.343	1,529.813	222.47	531.01	383.596	501.056	117.46

A statement of the engineering expenses of the division and tables of contracts completed during the fiscal year and of those in force at its close are hereto appended.

Respectfully submitted,

L. B. HARRISON.

Division Engineer.

Construction of Barge Canal — Head Office Account—(Cont'd).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Rupert Sturtevant	Engineering draughtsman	$4 00 per day	$664 00	$5 32	$669 32
E. J. Sipple	Engineering draughtsman	4 00 per day	540 00	....	540 00
Le Roy S. Rickard	Engineering draughtsman	4 00 per day	416 00	....	416 00
H. W. Benedict	Engineering draughtsman	4 00 per day	153 00	....	153 00
O. F. Lewis	Engineering draughtsman	4 00 per day	84 00	....	84 00
R. R. Schearer	Architectural draughtsman	100 per month	1,200 00	....	1,200 00
Theron Ainsworth	Tracer	75 per month	900 00	....	900 00
J. H. McCormack, Jr.	Tracer	75 per month	900 00	....	900 00
E. C. Altenburg	Tracer	75 per month	900 00	....	900 00
L. B. Westfall	Tracer	75 per month	875 00	....	875 00
J. A. Pritchard	Tracer	75 per month	609 68	....	609 68
R. P. Campfield	Tracer	75 per month	225 00	....	225 00
C. E. Cruger	Tracer	75 per month	29 03	1 23	30 26
Geo. F. Chism	First assistant engineer	7 00 per day	2,086 00	162 42	2,248 42
T. M. Ripley	First assistant engineer	7 00 per day	2,129 00	23 50	2,152 50
E. J. Pickwick	First assistant engineer	7 00 per day	2,177 00	30 67	2,207 67
Fred C. Davis	First assistant engineer	7 00 per day	1,204 00	....	1,204 00
L. C. Hulburd	First assistant engineer	7 00 per day	1,162 00	23 29	1,185 29
A. G. Hayden	Assistant engineer	6 00 per day	1,586 00	....	1,586 00
E. J. Doyle	Assistant engineer	6 00 per day	1,737 00	....	1,737 00
W. H. Slingerland, Jr.	Assistant engineer	6 00 per day	1,608 50	18 61	1,627 11
F. N. Sanders	Assistant engineer	6 00 per day	1,494 00	....	1,494 00
Clark Brown	Assistant engineer	6 00 per day	1,854 00	....	1,854 00
O. F. Bellows	Assistant engineer	6 00 per day	1,872 00	29 30	1,901 30
W. H. Van Wie	Assistant engineer	6 00 per day	942 00	....	942 00
Charles H. Hoyt	Assistant engineer	6 00 per day	1,074 00	....	1,074 00
J. A. O'Connor	Assistant engineer	6 00 per day	516 00	16 25	532 25
G. G. Underhill	Assistant engineer	6 00 per day	1,560 00	4 34	1,564 34
H. O. Schermerhorn	Assistant engineer	6 00 per day	1,872 00	....	1,872 00
W. G. Wildes	Assistant engineer	6 00 per day	1,884 00	....	1,884 00
D. E. Bellows	Assistant engineer	6 00 per day	90 00	1 48	91 48
J. W. Hughes	Assistant engineer	6 00 per day	168 00	....	168 00
W. S. Coulter	Assistant engineer	6 00 per day	1,866 00	....	1,866 00
H. A. Weeks	Assistant engineer	6 00 per day	1,860 00	....	1,860 00
C. R. Chase	Assistant engineer	6 00 per day	1,860 00	....	1,860 00
B. W. Rosekrans	Assistant engineer	6 00 per day	1,854 00	....	1,854 00
I. W. Irish	Assistant engineer	6 00 per day	1,326 00	....	1,326 00
L. S. Hulburd	Assistant engineer	6 00 per day	1,866 00	....	1,866 00
George H. Penfield	Assistant engineer	6 00 per day	1,854 00	....	1,854 00
F. M. Eames	Assistant engineer	6 00 per day	1,854 00	....	1,854 00
F. W. Harris	Assistant engineer	6 00 per day	1,338 00	....	1,338 00
C. J. McDonough	Assistant engineer	6 00 per day	894 00	....	894 00
H. E. Smith	Assistant engineer	6 00 per day	1,860 00	....	1,860 00
J. H. McElroy	Assistant engineer	6 00 per day	1,848 00	53 12	1,901 12
W. R. Neely	Assistant engineer	6 00 per day	1,860 00	....	1,860 00
Charles Keihm	Assistant engineer	6 00 per day	1,824 00	....	1,824 00
J. P. Newton	Assistant engineer	6 00 per day	1,839 00	....	1,839 00
G. E. Gibson	Assistant engineer	6 00 per day	1,797 00	....	1,797 00
A. E. Steere	Assistant engineer	6 00 per day	1,731 00	....	1,731 00
James Burden	Assistant engineer	6 00 per day	1,872 00	1 80	1,873 80
P. E. Green	Assistant engineer	6 00 per day	66 00	....	66 00
F. D. Williams	Assistant engineer	6 00 per day	324 00	....	324 00
A. D. Sanderson	Assistant engineer	6 00 per day	1,872 00	50 18	1,922 18
R. S. Greenman	Assistant engineer	6 00 per day	582 00	113 25	695 25
E. D. Hendricks	Assistant engineer	6 00 per day	1,827 00	....	1,827 00
P. W. O'Grady	Assistant engineer	6 00 per day	78 00	....	78 00
Thomas R. Tetley, Jr.	Assistant engineer	6 00 per day	36 00	....	36 00
H. F. Kellogg	Assistant engineer	5 50 per day	312 00	....	312 00
E. C. Alcott	Assistant engineer	5 00 per day	1,515 00	....	1,515 00
L. Bartlett	Assistant engineer	5 00 per day	1,546 50	....	1,546 50
C. W. Morris, Jr.	Assistant engineer	5 00 per day	1,467 50	....	1,467 50
B. J. Lowenstein	Assistant engineer	5 00 per day	1,001 00	....	1,001 00
F. J. Wilbur	Assistant engineer	5 00 per day	1,270 00	....	1,270 00
R. E. Phillips	Assistant engineer	5 00 per day	1,530 00	....	1,530 00
F. C. Ashley	Assistant engineer	5 00 per day	1,420 00	....	1,420 00
J. B. Maguire	Assistant engineer	5 00 per day	975 00	....	975 00
Royden L. Holt	Assistant engineer	5 00 per day	740 00	....	740 00
F. A. Biggi	Assistant engineer	5 00 per day	865 00	....	865 00
M. D. Casler	Leveler	5 00 per day	800 00	....	800 00
G. H. Haley	Leveler	5 00 per day	971 50	....	971 50
O. Hasbrouck	Leveler	5 00 per day	865 00	....	865 00
G. G. Sweet	Leveler	5 00 per day	1,518 50	....	1,518 50
R. J. Lyon	Leveler	5 00 per day	1,499 50	....	1,499 50
George W. Bradley	Leveler	4 50 per day	45 00	....	45 00
F. C. Koerner	Leveler	4 50 per day	1,079 00	2 68	1,081 68
S. F. Carlisle	Leveler	4 50 per day	1,309 50	....	1,309 50

Construction of Barge Canal—Head Office Account—(Concl'd).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
H. A. Sylvester	Leveler	$4 50 per day	$94 50	....	$94 50
W. A. Lafler	Leveler	4 50 per day	121 50	....	121 50
C. E. Weed	Leveler	4 50 per day	1,309 50	....	1,309 50
C. J. Ranney	Leveler	4 50 per day	18 00	....	18 00
T. L. Watkins	Leveler	4 50 per day	856 00	....	856 00
H. S. Sparr	Rodman	4 00 per day	586 50	....	586 50
A. G. Chapman	Rodman	4 00 per day	236 00	$4 81	240 81
F. Roberts	Rodman	4 00 per day	1,168 00	....	1,168 00
R. W. Fivey	Chainman	3 00 per day	916 50	....	916 50
F. L. Fonda	Chainman	3 00 per day	78 00	....	78 00
E. C. Niles	Chainman	3 00 per day	537 00	2 48	539 48
Hugh Henderson, Jr.	Chainman	2 50 per day	202 00	4 46	206 46
W. H. Dodd	Chainman	2 50 per day	691 00	....	691 00
F. M. Hill	Title maker	3 00 per day	918 00	....	918 00
E. H. Wetsel	Foreman of public works	3 00 per day	776 50	....	776 50
Howard Crounse	Inspector	5 00 per day	522 00	....	522 00
E. B. Garrison	Inspector	3 50 per day	606 50	....	606 50
J. B. Ryder	Inspector	3 50 per day	80 50	....	80 50
W. E. Waterbury	Inspector	3 50 per day	207 00	....	207 00
E. F. Weeks	Inspector	3 50 per day	658 00	....	658 00
M. S. Bierce	Inspector	3 50 per day	735 50	....	735 50
H. A. Carroll	Inspector	3 50 per day	402 00	....	402 00
Ed. Mason	Boatman	3 00 per day	360 00	....	360 00
Joseph Sweeney	Boatman	3 00 per day	78 00	....	78 00
F. C. Armstrong	Laborer	2 00 per day	42 00	....	42 00
A. Bailey	Laborer	2 00 per day	234 00	....	234 00
T. Brennen	Laborer	2 00 per day	40 00	....	40 00
T. E. Bowen	Laborer	2 00 per day	378 00	....	378 00
P. Buchanan	Laborer	2 00 per day	406 00	....	406 00
J. H. Boyland	Laborer	2 00 per day	290 00	....	290 00
J. L. Banker	Laborer	2 00 per day	416 00	....	416 00
L. F. Cashman	Laborer	2 00 per day	282 00	....	282 00
T. Clancy	Laborer	2 00 per day	730 00	....	730 00
O. V. Crounse	Laborer	2 00 per day	158 00	....	158 00
J. E. Dempsey	Laborer	2 00 per day	406 00	....	406 00
W. P. Deevey	Laborer	2 00 per day	60 00	....	60 00
J. B. Flower	Laborer	2 00 per day	42 00	....	42 00
J. G. Bushnell	Laborer	2 00 per day	342 00	....	342 00
S. Feenan	Laborer	2 00 per day	118 00	....	118 00
T. J. Fitzpatrick	Laborer	2 00 per day	150 00	....	150 00
B. Gazler	Laborer	2 00 per day	620 00	....	620 00
L. L. Gowdy	Laborer	2 00 per day	30 00	....	30 00
P. J. Gaffney	Laborer	2 00 per day	156 00	....	156 00
B. R. Healy	Laborer	2 00 per day	174 00	....	174 00
Frank Hanna	Laborer	2 00 per day	78 00	....	78 00
B. Houghtaling	Laborer	2 00 per day	620 00	....	620 00
H. A. Harcourt	Laborer	2 00 per day	184 00	....	184 00
C. F. Kinloch	Laborer	2 00 per day	222 00	....	222 00
Henry W. Koreman	Laborer	2 00 per day	360 00	....	360 00
C. Livingston	Laborer	2 00 per day	240 00	....	240 00
J. M. MacDonald	Laborer	2 00 per day	606 00	....	606 00
G. D. Meer	Laborer	2 00 per day	158 00	....	158 00
H. MacFarlane	Laborer	2 00 per day	76 00	....	76 00
E. Nichols	Laborer	2 00 per day	376 00	1 45	377 45
E. S. Palmer	Laborer	2 00 per day	224 00	....	224 00
J. L. Quinn	Laborer	2 00 per day	360 00	....	360 00
D. Roach	Laborer	2 00 per day	350 00	....	350 00
J. F. Smith	Laborer	2 00 per day	60 00	....	60 00
H. Sager	Laborer	2 00 per day	296 00	....	296 00
H. J. Soules	Laborer	2 00 per day	206 00	....	206 00
J. J. Tobin	Laborer	2 00 per day	294 00	....	294 00
M. Tierney	Laborer	2 00 per day	360 00	....	360 00
C. Ten Eyck	Laborer	2 00 per day	308 00	....	308 00
A. F. Wilson	Laborer	2 00 per day	298 00	....	298 00
W. A. Yanke	Laborer	2 00 per day	288 00	....	288 00
			$191,454 95	$3,949 81	$198,404 76

Incidental Expenses.

Instruments, tools and appliances	$971 72	
Office rent	2,163 17	
Fuel and light	327 34	
Stationery and printing	3,666 48	
Postage	257 85	
Telephone and telegraph	497 80	
Miscellaneous	7,947 12	
		15,831 48
Total		$214,236 24

Construction of Barge Canal — Erie Canal.

Chapter 147, Laws of 1903; Chapter 143, Laws of 1905; Chapter 172, Laws of 1907.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
C. W. Trumbull	Division engineer	$3,600 per year	$300 00	$5 86	$305 86
J. F. Creeden	Division engineer	3,600 per year	596 77	8 58	605 35
L. B. Harrison	Division engineer	3,600 per year	300 00	....	300 00
T. W. Barrally	Resident engineer	2,400 per year	200 00	31 40	231 40
S. M. Savage	Resident engineer	2,400 per year	2,400 00	242 76	2,642 76
H. W. De Graff	Resident engineer	2,400 per year	1,171 00	136 44	1,307 44
F. P. Williams	Resident engineer	2,400 per year	1,400 00	136 53	1,536 53
C. A. Poole	Resident engineer	2,400 per year	600 00	45 70	645 70
H. P. Willis	Resident engineer	2,400 per year	1,240 00	119 12	1,359 12
J. A. Underwood	Financial clerk	5 00 per day	75 00	....	75 00
Charles Stark	Financial clerk	5 00 per day	355 00	....	355 00
P. D. Wendell	Estimate clerk	5 00 per day	280 00	7 92	287 92
Matie Kelly	Stenographer	100 per month	249 98	....	249 98
B. L. Fredendall	Stenographer	100 per month	37 50	....	37 50
Chas. B. Dunham, Jr.	Clerk	75 per month	7 26	....	7 26
E. G. Blessing	Engineering draughtsman	5 00 per day	36 00	....	36 00
W. J. Weigmann	Engineering draughtsman	5 00 per day	180 00	....	180 00
W. R. Gordon	Engineering draughtsman	5 00 per day	400 00	....	400 00
C. E. Cruger	Engineering draughtsman	4 50 per day	20 97	....	20 97
W. J. Picard	Engineering draughtsman	4 50 per day	100 00	....	100 00
F. R. Hebard	Engineering draughtsman	4 00 per day	1,168 00	....	1,168 00
H. N. Stickney	Engineering draughtsman	4 00 per day	24 00	....	24 00
F. W. Madigan	Engineering draughtsman	4 00 per day	300 50	....	300 50
F. E. Gillen	Tracer	75 00 per month	659 67	....	659 67
J. A. Pritchard	Tracer	75 00 per month	12 90	....	12 90
C. S. Allen	Tracer	75 00 per month	19 35	....	19 35
F. C. Davis	First assistant engineer	6 00 per day	1,001 00	5 00	1,006 00
Edwin Hilborn	First assistant engineer	6 00 per day	1,884 00	698 29	2,582 29
D. F. Fulton	Assistant engineer	6 00 per day	108 00	6 94	114 94
F. P. Larmon	Assistant engineer	6 00 per day	786 00	....	786 00
M. F. James	Assistant engineer	6 00 per day	1,869 00	40 12	1,909 12
W. H. Van Wie	Assistant engineer	6 00 per day	904 00	130 57	1,034 57
George I. Oakley	Assistant engineer	6 00 per day	1,833 00	409 15	2,242 15
A. E. Steere	Assistant engineer	6 00 per day	114 00	1 66	115 66
P. W. O'Grady	Assistant engineer	6 00 per day	1,866 00	142 30	2,008 30
C. H. McCulloch	Assistant engineer	6 00 per day	1,944 00	115 63	2,059 63
E. Anderberg	Assistant engineer	6 00 per day	504 00	29 86	533 86
F. W. Harris	Assistant engineer	6 00 per day	534 00	10 62	544 62
Ed. Styring	Assistant engineer	6 00 per day	150 00	7 16	157 16
R. Hopkins	Assistant engineer	5 50 per day	643 50	....	643 50
J. B. Maguire	Assistant engineer	5 00 per day	585 00	....	585 00
R. H. Merrill	Assistant engineer	5 00 per day	1,500 00	102 40	1,602 40
D. E. Pellows	Assistant engineer	5 00 per day	1,470 00	590 20	2,060 20
Fred Edwards	Assistant engineer	5 00 per day	125 00	....	125 00
A. G. Austin	Assistant engineer	5 00 per day	1,419 50	....	1,419 50
H. W. Benedict	Assistant engineer	5 00 per day	81 00	....	81 00
E. J. Pecker	Assistant engineer	5 00 per day	747 50	77 50	825 00
O. Hasbrouck	Leveler	5 00 per day	715 00	....	715 00
I. S. Matlaw	Leveler	5 00 per day	1,363 00	....	1,363 00
O. F. Lewis	Leveler	4 50 per day	1,224 50	....	1,224 50
H. B. Furnside	Leveler	4 50 per day	54 00	....	54 00
C. N. Pierce	Leveler	4 50 per day	315 00	....	315 00
H. Gleason	Leveler	4 50 per day	270 00	....	270 00
H. A. Sylvester	Leveler	4 50 per day	958 50	....	958 50
F. E. Driscoll	Leveler	4 50 per day	36 00	....	36 00
C. E. Weed	Leveler	4 50 per day	85 50	....	85 50
C. G. Ranney	Leveler	4 50 per day	1,201 50	....	1,201 50
D. A. Young	Leveler	4 50 per day	387 00	....	387 00
H. W. Penkart	Leveler	4 50 per day	529 00	....	529 00
H. A. Holmquist	Leveler	4 50 per day	1,217 50	....	1,217 50
J. L. Sawyer	Leveler	4 50 per day	132 50	....	132 50
O. L. Eltinge	Rodman	4 00 per day	48 00	....	48 00
H. J. Richardson	Rodman	4 00 per day	520 00	68 93	588 93
E. Hulsapple	Rodman	3 50 per day	1,092 00	....	1,092 00
T. L. Watkins	Rodman	3 50 per day	157 50	....	157 50
C. S. Dietz	Rodman	3 50 per day	528 50	....	528 50
H. T. Arnold	Rodman	3 50 per day	406 00	....	406 00
B. J. Lowenstein	Rodman	3 50 per day	17 50	....	17 50
C. L. Baldwin	Rodman	3 50 per day	133 00	....	133 00
J. A. Glowinski	Rodman	3 50 per day	238 00	....	238 00
Geo. Van Nostrand	Rodman	3 50 per day	329 00	....	329 00
Geo. Fuller	Rodman	3 50 per day	7 00	....	7 00
S. R. Tighe	Rodman	3 50 per day	276 50	....	276 50

Construction of Barge Canal — Erie Canal — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
H. S. Miller	Chainman	$3 00 per day	$180 00		$180 00
W. J. Popp	Chainman	2 50 per day	195 00		195 00
T. J. Loonie	Chainman	2 50 per day	25 00		25 00
H. A. Joseph	Chainman	2 50 per day	60 00		60 00
F. Teall	Chainman	2 50 per day	681 00		681 00
F. R. Stevens	Chainman	2 50 per day	92 50		92 50
J. A. Young	Chainman	2 50 per day	40 00		40 00
H. P. O'Bryan	Chainman	2 50 per day	786 00		786 00
F. B. Stoddard	Chainman	2 50 per day	762 50		762 50
E. C. Dollard	Chainman	2 50 per day	362 50		362 50
C. H. Adams	Chainman	2 50 per day	365 00		365 00
H. F. Eagan	Chainman	2 50 per day	370 00		370 00
R. Shelley	Chainman	2 50 per day	137 50		137 50
E. W. Dalton	Chainman	2 50 per day	37 50		37 50
R. Haverly	Chainman	2 50 per day	175 00		175 00
A. Evans	Inspector of public works	4 50 per day	345 50		345 50
James Sim	Inspector of masonry	4 00 per day	380 00		380 00
E. L. Keeler	Inspector of masonry	4 00 per day	164 00		164 00
J. M. Taylor	Inspector of masonry	4 00 per day	96 00		96 00
E. V. Allendorph	Inspector of masonry	4 00 per day	258 50		258 50
W. A. Walter	Inspector of masonry	4 00 per day	240 00		240 00
H. T. Hughes	Inspector of masonry	4 00 per day	268 00		268 00
W. W. Barclay	Inspector of masonry	4 00 per day	220 00		220 00
W. H. H. Klinkhart	Inspector of masonry	4 00 per day	276 00		276 00
G. M. Harrer	Inspector of masonry	4 00 per day	312 00		312 00
James T. Brady	Inspector	4 50 per day	4 50	$3 98	8 48
Stowell & Cunningham	Experts		189 18		189 18
J. F. Stearns	Expert driller	5 00 per day	65 00		65 00
W. H. Breen	Foreman of borings	3 50 per day	497 00		497 00
J. J. Farrell	Boatman	3 00 per day	243 00		243 00
W. L. Van Epps	Boatman	3 00 per day	216 00		216 00
V. A. Shutz	Boatman	3 00 per day	9 00		9 00
Ed. Howard	Boatman	3 00 per day	438 00	11 29	449 29
Geo. W. Waters	Boatman	3 00 per day	438 00		438 00
Wm. McGinty	Boatman	3 00 per day	276 00		276 00
V. Massaret	Boatman	3 00 per day	174 00		174 00
H. Hibbard	Boatman	3 00 per day	45 00	19 02	64 02
H. A. Mehrtens	Boatman	3 00 per day	393 00		393 00
A. Hitchcock	Boatman	3 00 per day	615 00		615 00
Samuel Ash	Boatman	3 00 per day	222 00		222 00
Joseph Sweeney	Boatman	3 00 per day	72 00		72 00
S. Y. McGregor	Boatman	3 00 per day	805 00		805 00
T. H. McDonough	Boatman	3 00 per day	120 00		120 00
M. J. Waters	Boatman	3 00 per day	384 00		384 00
James H. Dolan	Boatman	3 00 per day	303 00		303 00
Thomas McDermott	Boatman	3 00 per day	54 00		54 00
Ralph Adams	Laborer	2 00 per day	170 00		170 00
T. C. Armstrong	Laborer	2 00 per day	130 00		130 00
J. L. Bacon	Laborer	2 00 per day	338 00		338 00
P. H. Buch	Laborer	2 00 per day	48 00		48 00
T. B. Bowes	Laborer	2 00 per day	250 00		250 00
E. J. Bradley	Laborer	2 00 per day	382 00		382 00
G. A. Bold	Laborer	2 00 per day	12 00		12 00
T. Brennan	Laborer	2 00 per day	194 00		194 00
J. Blute	Laborer	2 00 per day	62 00		62 00
F. A. Boltwood	Laborer	2 00 per day	332 00		332 00
R. J. Curtis	Laborer	2 00 per day	242 00		242 00
M. Conroy	Laborer	2 00 per day	250 00		250 00
M. Casler	Laborer	2 00 per day	74 00		74 00
J. W. Childs	Laborer	2 00 per day	194 00		194 00
H. L. Coons	Laborer	2 00 per day	158 00		158 00
M. Connors	Laborer	2 00 per day	34 00		34 00
E. Cocker	Laborer	2 00 per day	212 00		212 00
F. Derrick	Laborer	2 00 per day	82 00		82 00
H. C. Duryee	Laborer	2 00 per day	20 00		20 00
R. E. Demming	Laborer	2 00 per day	18 00		18 00
H. Eysaman	Laborer	2 00 per day	96 00		96 00
H. F. Eagan	Laborer	2 00 per day	276 00		276 00
C. Fogarty	Laborer	2 00 per day	142 00		142 00
J. P. Fox	Laborer	2 00 per day	228 00		228 00
J. H. Faxon, Jr	Laborer	2 00 per day	36 00		36 00
Wm. Fogarty	Laborer	2 00 per day	372 00		372 00
I. G. Flack	Laborer	2 00 per day	24 00		24 00
H. A. Falconer	Laborer	2 00 per day	614 00		614 00
S. Gifford	Laborer	2 00 per day	34 00		34 00

Construction of Barge Canal — Erie Canal — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
T. Gleason	Laborer	$2 00 per day	$16 00	....	$16 00
L. L. Gowdy	Laborer	2 00 per day	122 00	....	122 00
P. J. Gaffney	Laborer	2 00 per day	174 00	....	174 00
H. Graham	Laborer	2 00 per day	288 00	....	288 00
W. M. Griffith	Laborer	2 00 per day	256 00	....	256 00
B. Gilday	Laborer	2 00 per day	274 00	....	274 00
L. F. Hichman	Laborer	2 00 per day	406 00	....	406 00
J. Haley	Laborer	2 00 per day	220 00	....	220 00
F. Hinman	Laborer	2 00 per day	84 00	....	84 00
F. Hanna	Laborer	2 00 per day	106 00	....	106 00
E. B. Hollenbeck	Laborer	2 00 per day	622 00	....	622 00
H. Henderson	Laborer	2 00 per day	26 00	....	26 00
E. G. Hollenbeck	Laborer	2 00 per day	666 00	....	666 00
M. Hart	Laborer	2 00 per day	428 00	....	428 00
O. Haggerty	Laborer	2 00 per day	238 00	....	238 00
A. D. Ilse	Laborer	2 00 per day	6 00	....	6 00
W. Ingols	Laborer	2 00 per day	304 00	....	304 00
H. E. Jeandroult	Laborer	2 00 per day	34 00	....	34 00
R. C. Kirkpatrick	Laborer	2 00 per day	138 00	....	138 00
T. Keane	Laborer	2 00 per day	324 00	....	324 00
J. Lavery	Laborer	2 00 per day	620 00	....	620 00
T. Lilly	Laborer	2 00 per day	274 00	....	274 00
J. Loughlin	Laborer	2 00 per day	336 00	....	336 00
R. L. Loder	Laborer	2 00 per day	276 00	....	276 00
G. Myers	Laborer	2 00 per day	28 00	....	28 00
T. McMahon	Laborer	2 00 per day	68 00	....	68 00
W. Mangan	Laborer	2 00 per day	274 00	....	274 00
J. McDonald	Laborer	2 00 per day	36 00	....	36 00
T. F. Madden	Laborer	2 00 per day	288 00	....	288 00
B. L. Munn	Laborer	2 00 per day	216 00	....	216 00
P. J. McGowan	Laborer	2 00 per day	258 00	....	258 00
F. A. McManus	Laborer	2 00 per day	214 00	....	214 00
A. D. Mesick	Laborer	2 00 per day	174 00	....	174 00
D. Morris	Laborer	2 00 per day	240 00	....	240 00
W. S. McLachlin	Laborer	2 00 per day	20 00	....	20 00
G. McKenna	Laborer	2 00 per day	144 00	....	144 00
E. C. Niles	Laborer	2 00 per day	76 00	....	76 00
C. Phelps	Laborer	2 00 per day	80 00	....	80 00
W. J. Ryan	Laborer	2 00 per day	234 00	....	234 00
E. H. Robinson	Laborer	2 00 per day	356 00	....	356 00
George Strong	Laborer	2 00 per day	342 00	$1 72	343 72
John Seaman	Laborer	2 00 per day	650 00	....	650 00
H. F. Smith	Laborer	2 00 per day	140 00	....	140 00
A. Suits	Laborer	2 00 per day	72 00	....	72 00
C. L. Spence	Laborer	2 00 per day	238 00	....	238 00
J. Shaughnessy	Laborer	2 00 per day	282 00	....	282 00
A. R. Smith	Laborer	2 00 per day	44 00	....	44 00
George Terry	Laborer	2 00 per day	106 00	....	106 00
O. Thomas	Laborer	2 00 per day	68 00	....	68 00
B. Tomponski	Laborer	2 00 per day	190 00	....	190 00
F. Tyre	Laborer	2 00 per day	154 00	....	154 00
G. Thomas	Laborer	2 00 per day	122 00	....	122 00
E. W. Thomas	Laborer	2 00 per day	360 00	....	360 00
W. Vollborn	Laborer	2 00 per day	96 00	....	96 00
J. L. Walton	Laborer	2 00 per day	68 00	....	68 00
J. White	Laborer	2 00 per day	132 00	....	132 00
C. J. Wood	Laborer	2 00 per day	144 00	....	144 00
W. Walrath	Laborer	2 00 per day	168 00	....	168 00
M. F. Wemple	Laborer	2 00 per day	220 00	....	220 00
W. Wolf	Laborer	2 00 per day	254 00	....	254 00
B. S. Weaver	Laborer	2 00 per day	368 00	....	368 00
I. B. Walker	Laborer	2 00 per day	228 00	....	228 00
C. W. Young	Gage reader	14 00 per month	140 00	....	140 00
S. S. Fonda	Gage reader	7 00 per month	14 00	....	14 00
A. Davendorph	Gage reader	7 00 per month	64 81	....	64 81
R. S. Marshall	Gage reader	7 00 per month	42 00	....	42 00
A. Coshun	Gage reader	7 00 per month	21 00	....	21 00
H. Edick, Jr	Gage reader	7 00 per month	84 00	....	84 00
W. B. Dunstan	Gage reader	7 00 per month	7 00	....	7 00
J. B. Mahoney	Gage reader	7 00 per month	42 00	....	42 00
M. E. Wheeler	Gage reader	7 00 per month	63 10	....	63 10
W. Quackenbush	Gage reader	7 00 per month	56 00	....	56 00
W. Butler	Gage reader	7 00 per month	56 00	....	56 00
J. Reepmeyer, Jr	Gage reader	7 00 per month	84 00	....	84 00
E. A. Vrooman	Gage reader	7 00 per month	56 00	....	56 00

Construction of Barge Canal — Erie Canal — (Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
J. B. Mackey	Gage reader	$7 00 per month	$56 00	....	$56 00
A. M. Spencer	Gage reader	7 00 per month	49 00	....	49 00
M. K. Freemeyer, Jr	Gage reader	7 00 per month	7 00	....	7 00
H. Hockle	Gage reader	7 00 per month	9 26	....	9 26
E. L. Hoffman	Gage reader	7 00 per month	56 00	....	56 00
P. C. Pickard	Gage reader	7 00 per month	56 00	....	56 00
R. Wilson	Gage reader	6 00 per month	72 00	....	72 00
J. Fernald	Gage reader	5 00 per month	20 00	....	20 00
G. Amen	Gage reader	5 00 per month	20 00	....	20 00
C. V. Barrett	Gage reader	5 00 per month	20 00	....	20 00
L. Kast	Gage reader	5 00 per month	55 00	....	55 00
J. J. Gilbert	Gage reader	3 00 per month	12 00	....	12 00
			$76,485 75	$3,206 65	$79,692 40

Incidental Expenses.

Instruments, tools and appliances	$795 39	
Office rent	690 96	
Fuel and light	492 60	
Stationery and printing	105 01	
Postage	84 18	
Telephone and telegraph	337 18	
Miscellaneous	1,830 76	
		4,336 08
Total		$84,028 48

Construction of Barge Canal — Champlain Canal.

Chapter 147, Laws of 1903; Chapter 143, Laws of 1905; Chapter 172, Laws of 1907.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
C. W. Trumbull	Division engineer	$3,600 per year	$150 00	....	$150 00
J. F. Creeden	Division engineer	3,600 per year	288 71	....	288 71
L. B. Harrison	Division engineer	3,600 per year	150 00	....	150 00
J. R. Kaley	Resident engineer	2,400 per year	985 72	$95 37	1,081 09
E. V. R. Payne	Resident engineer	2,400 per year	1,400 00	174 88	1,574 88
Stowell & Cunningham	Experts	....	97 21	....	97 21
J. A. Underwood	Financial clerk	5 00 per day	160 00	....	160 00
Charles Stark	Financial clerk	5 00 per day	305 00	....	305 00
P. D. Wendell	Estimate clerk	5 00 per day	395 00	33 44	428 44
Matie Kelly	Stenographer	83 33 per month	83 34	....	83 34
J. E. Phinney	Stenographer	75 00 per month	795 00	....	795 00
A. Robinson	Temporary stenographer	2 00 per day	8 00	....	8 00
D. E. Damon	Engineering draughtsman	4 00 per day	620 00	....	620 00
J. P. Hurley	Engineering draughtsman	4 00 per day	340 00	....	340 00
J. A. Galvin	Engineering draughtsman	4 00 per day	1,236 00	....	1,236 00
T. B. Holmes	Engineering draughtsman	4 00 per day	1,276 00	....	1,276 00
F. C. Koerner	Engineering draughtsman	4 00 per day	212 00	....	212 00
W. J. Picard	Engineering draughtsman	4 00 per day	156 00	....	156 00
H. N. Peck	Bridge draughtsman	115 00 per month	7 42	....	7 42
C. G. Lamphere	Tracer	50 00 per month	150 00	....	150 00
P. J. Cleaver	First assistant engineer	7 00 per day	1,470 00	92 53	1,562 53
L. C. Hulburd	First assistant engineer	7 00 per day	1,134 00	155 75	1,289 75
D. B. La Du	Assistant engineer	6 00 per day	2,022 00	781 25	2,803 25
W. B. Watson	Assistant engineer	6 00 per day	648 00	....	648 00
D. F. Fulton	Assistant engineer	6 00 per day	1,770 00	1,116 30	2,886 30
Herbert Spencer	Assistant engineer	6 00 per day	1,980 00	305 98	2,285 98
Harry Shoemaker	Assistant engineer	6 00 per day	1,912 50	192 37	2,104 87
H. C. Kline	Assistant engineer	6 00 per day	900 00	....	900 00
S. W. Belding	Assistant engineer	5 00 per day	1,620 00	4,021 00	1,660 21
H. W. Benedict	Assistant engineer	5 00 per day	135 00	....	135 00
A. C. Richards	Assistant engineer	5 00 per day	1,446 00	....	1,446 00
J. B. Foote	Leveler	5 00 per day	1,521 00	....	1,521 00
R. G. Gibson	Leveler	4 50 per day	706 50	....	706 50
John McBride	Leveler	4 50 per day	229 50	....	229 50
H. R. Leland	Leveler	4 50 per day	99 00	....	99 00
W. C. Benedict	Leveler	4 50 per day	1,134 50	....	1,134 50
C. A. Curtis	Leveler	4 50 per day	1,507 50	....	1,507 50
R. F. Hall	Leveler	4 50 per day	318 00	....	318 00
H. J. Richardson	Rodman	4 00 per day	292 00	101 22	393 22
P. T. Gordon	Rodman	4 00 per day	368 00	....	368 00

Construction of Barge Canal — Champlain Canal — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Geo. W. Wright	Rodman	$3 50 per day	$119 00		$119 00
H. T. Clark	Rodman	3 50 per day	910 00		910 00
J. E. Walsh	Rodman	3 50 per day	283 50		283 50
David Noonan	Rodman	3 50 per day	388 50		388 50
A. R. Patchke	Rodman	3 50 per day	262 50		262 50
G. E. Fuller	Rodman	3 50 per day	157 50		157 50
A. E. Wood	Chainman	3 00 per day	903 50		903 50
H. S. Miller	Chainman	3 00 per day	237 00		237 00
Lester P. Slaid	Chainman	2 50 per day	290 00		290 00
L. Y. Meneely	Chainman	2 50 per day	47 50		47 50
J. M. Prior	Chainman	2 50 per day	120 00		120 00
E. E. Babcock	Chainman	2 50 per day	140 00		140 00
C. T. Bown	Chainman	2 50 per day	132 50		132 50
F. C. Armstrong	Chainman	2 50 per day	519 52		519 52
Luke Van Valkenburg	Chainman	2 50 per day	229 00		229 00
G. M. Phelps	Chainman	2 50 per day	167 50		167 50
A. M. Walt	Inspector of public works	5 00 per day	1,484 00		1,484 00
J. C. Patrick	Inspector	4 50 per day	121 50		121 50
E. Vallendorph	Inspector of masonry	4 00 per day	914 50		914 50
R. E. Bierce	Inspector of masonry	4 00 per day	388 00		388 00
W. H. Breen	Inspector of masonry	4 00 per day	278 00		278 00
E. H. Wetsel	Foreman of public works	3 00 per day	156 00		156 00
T. B. Reichert	Boatman	3 00 per day	144 00		144 00
Wm. McGinty	Boatman	3 00 per day	312 00		312 00
V. Massaret	Boatman	3 00 per day	312 00		312 00
T. B. Kreft	Boatman	3 00 per day	755 00		755 00
Samuel Ash	Boatman	3 00 per day	78 00		78 00
Thos. F. McDermott	Boatman	3 00 per day	159 00		159 00
V. A. Snuts	Boatman	3 00 per day	216 00		216 00
Joseph Sweeney	Boatman	3 00 per day	81 00		81 00
Edward Mason	Boatman	3 00 per day	48 00		48 00
M. J. Waters	Boatman	3 00 per day	156 00		156 00
H. A. Mehrtens	Boatman	3 00 per day	195 00	$9 46	204 46
Ed. A. Howard	Boatman	3 00 per day	150 00		150 00
John A. Barrett	Laborer	2 00 per day	30 00		30 00
S. Bligh	Laborer	2 00 per day	22 00		22 00
C. Burns	Laborer	2 00 per day	158 00		158 00
T. Bowes	Laborer	2 00 per day	34 00		34 00
J. Bohrer	Laborer	2 00 per day	210 00		210 00
J. P. Canty	Laborer	2 00 per day	230 00		230 00
W. H. Clapp	Laborer	2 00 per day	274 00		274 00
J. H. Conniff	Laborer	2 00 per day	326 00		326 00
P. Clark	Laborer	2 00 per day	34 00		34 00
C. M. Chapman	Laborer	2 00 per day	158 00		158 00
G. DeBellefroid	Laborer	2 00 per day	506 00		506 00
W. Dunn	Laborer	2 00 per day	380 00		380 00
C. Davis	Laborer	2 00 per day	382 00		382 00
H. E. Ensign	Laborer	2 00 per day	342 00		342 00
J. J. Finn	Laborer	2 00 per day	62 00		62 00
E. Foley	Laborer	2 00 per day	30 00		30 00
J. H. Faxon	Laborer	2 00 per day	286 00		286 00
F. G. Fulton	Laborer	2 00 per day	276 00		276 00
P. A. Goyett	Laborer	2 00 per day	12 00		12 00
W. B. Graham	Laborer	2 00 per day	4 00		4 00
L. L. Gowdy	Laborer	2 00 per day	208 00		208 00
T. B. Hall	Laborer	2 00 per day	12 00		12 00
F. Hollren	Laborer	2 00 per day	358 00		358 00
J. Holtor	Laborer	2 00 per day	382 00		382 00
A. G. Horne	Laborer	2 00 per day	30 00		30 00
C. Hafley	Laborer	2 00 per day	156 00		156 00
M. E. Holohan	Laborer	2 00 per day	6 00		6 00
R. C. Kirkpatrick	Laborer	2 00 per day	96 00		96 00
B. H. Koertterits	Laborer	2 00 per day	60 00		60 00
E. P. Low	Laborer	2 00 per day	278 00		278 00
N. Mory	Laborer	2 00 per day	306 00		306 00
G. C. Maxfield	Laborer	2 00 per day	168 00		168 00
D. E. Moore	Laborer	2 00 per day	180 00		180 00
E. F. McLoughlin	Laborer	2 00 per day	26 00		26 00
H. McFarlane	Laborer	2 00 per day	54 00		54 00
J. McMahon	Laborer	2 00 per day	30 00		30 00
Wm. Maloney	Laborer	2 00 per day	300 00		300 00
Wm. Marshall	Laborer	2 00 per day	96 00		96 00
T. E. Mullen	Laborer	2 00 per day	10 00		10 00
J. McElroy	Laborer	2 00 per day	28 00		28 00

Construction of Barge Canal—Champlain Canal—(Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Wm. Mahoney	Laborer	$2 00 per day	$14 00	....	$14 00
E. J. Morrisey	Laborer	2 00 per day	8 00	....	8 00
J. P. Murray	Laborer	2 00 per day	6 00	....	6 00
C. H. Millard	Laborer	2 00 per day	518 00	....	518 00
E. Nichols	Laborer	2 00 per day	48 00	....	48 00
R. Nolan	Laborer	2 00 per day	8 00	....	8 00
F. O'Gorman	Laborer	2 00 per day	188 00	....	188 00
H. O. Pray	Laborer	2 00 per day	194 00	....	194 00
H. S. Pattee	Laborer	2 00 per day	162 00	....	162 00
J. J. Raup	Laborer	2 00 per day	712 00	....	712 00
I. Ryan, Jr	Laborer	2 00 per day	250 00	....	250 00
A. B. Roberts	Laborer	2 00 per day	30 00	....	30 00
E. D. Riley	Laborer	2 00 per day	76 00	....	76 00
A. Roules	Laborer	2 00 per day	20 00	....	20 00
J. Rock	Laborer	2 00 per day	278 00	....	278 00
H. F. Smith	Laborer	2 00 per day	134 00	....	134 00
E. Shanahan	Laborer	2 00 per day	354 00	....	354 00
W. A. Sanders	Laborer	2 00 per day	306 00	....	306 00
G. C. Schafer	Laborer	2 00 per day	6 00	....	6 00
M. J. Sullivan	Laborer	2 00 per day	10 00	....	10 00
P. Scully	Laborer	2 00 per day	34 00	....	34 00
I. V. Toole	Laborer	2 00 per day	264 00	....	264 00
A. S. Trumbull	Laborer	2 00 per day	154 00	....	154 00
L. C. Brazier	Gage reader	12 00 per month	134 00	....	134 00
R. S. Metcalf	Gage reader	7 00 per month	70 00	....	70 00
F. B. Sanders	Gage reader	7 00 per month	70 00	....	70 00
W. J. Curtis	Gage reader	7 00 per month	84 00	....	84 00
W. E. Downing	Gage reader	7 00 per month	84 00	....	84 00
U. B. Dunstan	Gage reader	7 00 per month	77 00	....	77 00
U. D. La Bar	Gage reader	7 00 per month	84 00	....	84 00
H. C. Tinker	Gage reader	7 00 per month	84 00	....	84 00
Geo. W. Baldwin	Gage reader	7 00 per month	56 00	....	56 00
A. W. Hollister	Gage reader	7 00 per month	42 90	....	42 90
F. C. Bristol	Gage reader	7 00 per month	84 00	....	84 00
S. L. Cluett	Gage reader	7 00 per month	56 00	....	56 00
George Hammond	Gage reader	7 00 per month	84 00	....	84 00
F. Sisson	Gage reader	7 00 per month	56 00	....	56 00
B. F. Thebo	Gage reader	7 00 per month	84 00	....	84 00
S. H. Pearson	Gage reader	7 00 per month	84 00	....	84 00
F. E. Chapman	Gage reader	5 00 per month	10 00	....	10 00
A. S. Mayhew	Gage reader	5 00 per month	10 00	....	10 00
			$48,471 51	$7,079 55	$55,551 06

Incidental Expenses.

Instruments, tools and appliances	$339 28	
Office rent	490 83	
Fuel and light	140 01	
Stationery and printing	104 66	
Postage	122 38	
Telephone and telegraph	301 80	
Miscellaneous	1,631 92	
		3,130 88
Total	....	$58,681 94

Improvement of Public Highways.

Chapter 115, Laws 1898, and amendatory laws.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
C. W. Trumbull	Division engineer	$3,600 per year	....	$58 36	$58 36
J. F. Creeden	Division engineer	3,600 per year	....	492 70	492 70
L. B. Harrison	Division engineer	3,600 per year	$75 00	354 26	429 26
C. H. Flanigan	First resident engineer	2,700 per year	1,575 00	554 55	2,129 55
D. W. Robbins	Resident engineer	225 per month	2,475 00	145 15	2,620 15
John R. Kaley	Resident engineer	200 per month	1,414 28	236 06	1,650 34
E. A. Lamb	Resident engineer	200 per month	1,400 00	263 23	1,663 23
F. M. Williams	Resident engineer	200 per month	1,000 00	317 38	1,317 38
H. K. Bishop	Hydraulic and macadam expert	8 00 per day	2,400 00	391 27	2,791 27
Chas. H. O'Neill	Confidential assistant	333 33 per month	1,542 97	202 01	1,744 98
W. J. Valleau	Financial clerk and auditor	233 33 per month	350 00	18 59	368 59
Luke A. Keenan	Financial clerk and auditor	233 33 per month	933 35	154 40	1,087 75
Charles Stark	Financial clerk	5 00 per day	275 00	....	275 00
Parks D. Wendell	Estimate clerk	5 00 per day	530 00	50 89	580 89
W. B. Strong	Estimate clerk	5 00 per day	1,495 00	....	1,495 00
John J. Allen	Canal clerk	....	....	35 80	35 80
J. M. Smelzer	Index clerk	83 33 per month	308 33	....	308 33
Mariam Brother	Clerk	50 00 per month	26 67	....	26 67
B. L. Fredendall	Stenographer	100 00 per month	595 00	....	595 00
Matie Kelly	Stenographer	100 00 per month	349 99	....	349 99
H. W. Cowlbeck	Stenographer	100 00 per month	270 97	4 14	275 11
A. D. Sharp	Stenographer	50 00 per month	25 00	....	25 00
Helen Brown	Temporary stenographer	75 00 per month	75 00	....	75 00
Mable E. Knight	Temporary stenographer	15 00 per week	53 57	....	53 57
F. M. Hill	Title maker	3 00 per day	15 00	....	15 00
J. E. Kirk	Messenger	75 00 per month	228 23	....	228 23
W. J. Kearney	Messenger	25 00 per month	200 00	....	200 00
O. J. Dempster	First assistant engineer	7 00 per day	574 00	295 90	869 90
G. H. Miller	First assistant engineer	7 00 per day	42 00	....	42 00
C. R. Allen, Jr	Assistant engineer	6 00 per day	1,637 00	336 33	1,973 33
E. F. Ayres	Assistant engineer	6 00 per day	1,872 00	74 89	1,946 89
H. E. Breed	Assistant engineer	6 00 per day	1,878 00	968 97	2,846 97
James L. Chapman	Assistant engineer	6 00 per day	1,704 00	430 81	2,134 81
C. M. Cole	Assistant engineer	6 00 per day	72 00	....	72 00
John C. Davis	Assistant engineer	6 00 per day	30 00	....	30 00
Perry Filkin	Assistant engineer	6 00 per day	1,524 00	481 01	2,005 01
J. C. Finch	Assistant engineer	6 00 per day	1,884 00	161 84	2,045 84
C. T. Fisher	Assistant engineer	6 00 per day	1,896 00	80 14	1,976 14
R. S. Greenman	Assistant engineer	6 00 per day	84 00	7 52	91 52
R. J. Harding	Assistant engineer	6 00 per day	162 00	11 70	173 70
L. T. Howard	Assistant engineer	6 00 per day	1,609 00	4,632 99	6,241 99
C. H. Hoyt	Assistant engineer	6 00 per day	132 00	53 05	185 05
L. W. Irish	Assistant engineer	6 00 per day	60 00	43 08	103 08
H. J. Langlois	Assistant engineer	6 00 per day	1,622 00	73 58	1,695 58
Kieffer Lindsey	Assistant engineer	6 00 per day	102 00	....	102 00
F. B. Morse	Assistant engineer	6 00 per day	1,884 00	125 60	2,009 60
F. J. Mulvaney	Assistant engineer	6 00 per day	1,896 00	446 02	2,342 02
R. J. Murray	Assistant engineer	6 00 per day	1,878 00	90 15	1,968 15
J. A. O'Connor	Assistant engineer	6 00 per day	468 00	123 69	591 69
E. G. Rayner	Assistant engineer	6 00 per day	1,956 00	10 60	1,966 60
O. C. Richards	Assistant engineer	6 00 per day	1,908 00	151 88	2,059 88
F. N. Sanders	Assistant engineer	6 00 per day	396 00	311 25	707 25
E. W. Sylvester	Assistant engineer	6 00 per day	1,662 00	123 72	1,785 72
J. H. Sturtevant	Assistant engineer	6 00 per day	1,819 00	3,653 92	5,472 92
N. A. Taylor	Assistant engineer	6 00 per day	1,932 00	343 32	2,275 32
J. B. Wright	Assistant engineer	6 00 per day	1,914 00	105 72	2,019 72
H. W. Benedict	Assistant engineer	5 00 per day	978 50	71 53	1,050 03
F. A. Biggi	Assistant engineer	5 00 per day	725 00	951 18	1,676 18
H. E. Blake	Assistant engineer	5 00 per day	763 50	157 80	921 30
W. G. Craig	Assistant engineer	5 00 per day	1,575 00	24 34	1,599 34
C. F. Crowley	Assistant engineer	5 00 per day	1,078 50	51 50	1,130 00
Frederick Edwards	Assistant engineer	5 00 per day	460 00	4 68	464 68
G. A. Ensign	Assistant engineer	5 00 per day	1,455 00	212 23	1,667 23
F. F. Gordon	Assistant engineer	5 00 per day	15 00	....	15 00
R. D. Hayes	Assistant engineer	5 00 per day	1,530 00	707 88	2,237 88
G. R. Halpin	Assistant engineer	5 00 per day	485 00	16 50	501 50
E. J. Howe	Assistant engineer	5 00 per day	1,590 00	122 22	1,712 22
A. C. Perkins	Assistant engineer	5 00 per day	1,090 00	208 65	1,298 65
T. J. Schoenlaub	Assistant engineer	5 00 per day	1,585 00	6 10	1,591 10
A. L. Simmons	Assistant engineer	5 00 per day	1,555 00	636 99	2,191 99
F. J. Seery	Assistant engineer	5 00 per day	45 00	....	45 00
W. W. Stone	Assistant engineer	5 00 per day	10 00	....	10 00
M. W. Wolff	Assistant engineer	5 00 per day	510 00	1 70	511 70

Improvement of Public Highways — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
F. C. Woodward	Assistant engineer	$5 00 per day	$1,460 50	$19 05	$1,479 55
M. W. Williams	Assistant engineer	5 00 per day	1,110 00	961 30	2,071 30
T. A. Hendrickson	Leveler	5 00 per day	945 00	24 08	969 08
L. L. Melius	Leveler	5 00 per day	1,295 00	71 89	1,366 89
Ralph Russell	Leveler	5 00 per day	860 00	195 28	1,055 28
A. W. Smith	Leveler	5 00 per day	1,411 00	474 76	1,885 76
M. J. Adams	Leveler	4 50 per day	45 00	....	45 00
C. C. Ahles	Leveler	4 50 per day	1,158 00	57 98	1,215 98
J. K. Brown	Leveler	4 50 per day	1,183 50	....	1,183 50
F. L. Bisbee	Leveler	4 50 per day	1,426 50	102 25	1,528 75
J. C. Bell	Leveler	4 50 per day	1,245 00	409 14	1,654 14
Le Roy W. Clark	Leveler	4 50 per day	31 50	....	31 50
Chas. Donahue	Leveler	4 50 per day	49 50	....	49 50
C. R. De Graff	Leveler	4 50 per day	1,301 00	3 82	1,304 82
H. C. Ellis	Leveler	4 50 per day	31 50	....	31 50
G. A. Flynn	Leveler	4 50 per day	1,404 00	20 86	1,424 86
W. G. Hager	Leveler	4 50 per day	22 50	....	22 50
G. A. Hool	Leveler	4 50 per day	1,372 50	3,252 09	4,624 59
J. J. Huber	Leveler	4 50 per day	1,295 00	4 78	1,299 78
W. T. Hunt	Leveler	4 50 per day	436 50	41 28	477 78
A J. Kaufman	Leveler	4 50 per day	1,143 00	14 67	1,157 67
Le Roy J. McCarthy	Leveler	4 50 per day	247 50	8 95	256 45
Raymond Sickles	Leveler	4 50 per day	54 00	13 35	67 35
W. R. Trumbull	Leveler	4 50 per day	1,372 50	74 59	1,447 09
A. G. Chapman	Inspector of masonry	5 00 per day	842 00	351 92	1,193 92
W. H. Breen	Inspector of highways	4 50 per day	364 00	15 25	379 25
H. R. Bedell	Inspector of highways	4 50 per day	1,377 00	24	1,377 24
F. A. Bedell	Inspector of highways	4 50 per day	1,327 50	16 70	1,344 20
Harry Bowen	Inspector of highways	4 50 per day	1,353 50	223 10	1,576 60
J. T. Brady	Inspector of highways	4 50 per day	1,615 50	612 68	2,228 18
G. H. Harter	Inspector of highways	4 50 per day	1,262 00	196 82	1,458 82
F. W. Hartwell	Inspector of highways	4 50 per day	1,280 00	40 73	1,320 73
W. S. McLachlin	Inspector of highways	4 50 per day	1,127 50	59 40	1,186 90
J. R. Mahan	Inspector of highways	4 50 per day	1,345 50	2 42	1,347 92
Jesse C. Patrick	Inspector of highways	4 50 per day	1,305 00	913 68	2,218 68
W. M. Payne	Inspector of highways	4 50 per day	1,394 00	109 47	1,503 47
H. C. Titus	Inspector of highways	4 50 per day	1,453 50	123 69	1,577 19
H. C. Wells	Inspector of highways	4 50 per day	715 50	7 56	723 06
W. E. Waterbury	Inspector of highways	4 50 per day	58 50	....	58 50
R. O. Hollenbeck	Inspector of highways	4 00 per day	1,256 00	3 70	1,259 70
A. M. Hollister	Inspector of highways	4 00 per day	84 00	....	84 00
H. S. Mattimore	Inspector of highways	4 00 per day	1,084 00	6 50	1,090 50
J. A. Wynkoop	Inspector of highways	4 00 per day	130 00	14 50	144 50
M. S. Bierce	Inspector of highways	3 50 per day	87 50	....	87 50
C. C. Baker	Inspector of highways	3 50 per day	234 50	12 07	246 57
G. E. Bates	Inspector of highways	3 50 per day	434 50	2 32	436 82
S. J. Bennett	Inspector of highways	3 50 per day	943 38	....	943 38
Geo. L. Blauvelt	Inspector of highways	3 50 per day	796 50	1 27	797 77
C. D. Boughton	Inspector of highways	3 50 per day	743 50	31 79	775 29
H. A. Carroll	Inspector of highways	3 50 per day	140 00	....	140 00
C. R. Cornwell	Inspector of highways	3 50 per day	658 50	94 72	753 22
A. B. Culver	Inspector of highways	3 50 per day	1,038 00	46 31	1,084 31
R. J. Curtis	Inspector of highways	3 50 per day	414 50	5 67	420 17
E. B. Garrison	Inspector of highways	3 50 per day	140 00	....	140 00
Alex Gauthier	Inspector of highways	3 50 per day	144 50	2 96	147 46
Blaine Gilday	Inspector of highways	3 50 per day	414 50	....	414 50
W. S. Gray	Inspector of highways	3 50 per day	234 50	22 87	257 37
L. Grossman	Inspector of highways	3 50 per day	855 50	21 24	876 74
B. E. Hodges	Inspector of highways	3 50 per day	35 00	6 94	41 94
W. E. L. Hunter	Inspector of highways	3 50 per day	438 50	142 80	581 30
J. V. Harrington	Inspector of highways	3 50 per day	14 00	....	14 00
W. E. Hayes	Inspector of highways	3 50 per day	122 50	....	122 50
P. D. Jump	Inspector of highways	3 50 per day	852 00	12 52	864 52
H. A. Knapp	Inspector of highways	3 50 per day	581 00	....	581 00
H. L. Michael	Inspector of highways	3 50 per day	954 50	16 31	970 81
John J. O'Hara, Jr	Inspector of highways	3 50 per day	761 50	....	761 50
F. H. Owens	Inspector of highways	3 50 per day	1,002 50	176 23	1,178 73
Harry E. Poole	Inspector of highways	3 50 per day	1,011 50	110 86	1,122 36
J. B. Ryder	Inspector of highways	3 50 per day	976 50	....	976 50
J. A. Thompson	Inspector of highways	3 50 per day	217 00	8 38	225 38
W. J. Ward	Inspector of highways	3 50 per day	730 50	259 24	989 74
L. Wachtel	Inspector of highways	3 50 per day	537 50	95 72	633 22
W. E. Wienholz	Inspector of highways	3 50 per day	234 50	81 38	315 88
H. N. Peck	Bridge draughtsman	5 00 per day	222 57	12 48	235 05

Improvement of Public Highways — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
C. D. Burrus	Engineering draughtsman	$5 00 per day	$1,195 00		$1,195 00
B. O. Burgin	Engineering draughtsman	5 00 per day	30 00		30 00
Wm. R. Gordon	Engineering draughtsman	5 00 per day	975 00	$64 28	1,039 28
M. W. Nelson	Engineering draughtsman	5 00 per day	1,535 00	61 07	1,596 07
J. A. O. Donnell	Engineering draughtsman	5 00 per day	1,217 50	15 00	1,232 50
W. E. Petty	Engineering draughtsman	5 00 per day	1,630 00	142 78	1,772 78
Alphonso Carrera	Engineering draughtsman	4 00 per day	841 00		841 00
L. W. Clark	Engineering draughtsman	4 00 per day	516 00		516 00
C. H. Chilvers	Engineering draughtsman	4 00 per day	1,152 00	77 56	1,229 56
C. F. de Clercq	Engineering draughtsman	4 00 per day	44 00	2 48	46 48
C. W. Diefendorf	Engineering draughtsman	4 00 per day	376 00		376 00
O. L. Elting	Engineering draughtsman	4 00 per day	732 00	7 61	739 61
E. C. Hackett	Engineering draughtsman	4 00 per day	1,170 50	67 36	1,237 86
G. D. Meere	Engineering draughtsman	4 00 per day	660 00		660 00
Clark D. Sniggs	Engineering draughtsman	4 00 per day	360 00		360 00
C. R. Waters	Engineering draughtsman	4 00 per day	484 00	23 92	507 92
W. G. White	Engineering draughtsman	4 00 per day	336 00		336 00
R. F. T. Wilke	Engineering draughtsman	4 00 per day	304 00	107 24	411 24
C. S. Allen	Engineering draughtsman	50 per hour	106 70		106 70
R. L. Angell	Engineering draughtsman	50 per hour	9 00		9 00
W. P. Benjamin	Engineering draughtsman	50 per hour	26 00		26 00
S. B. Easton	Engineering draughtsman	50 per hour	22 50		22 50
S. P. Grant	Engineering draughtsman	50 per hour	17 00		17 00
E. B. Fox	Engineering draughtsman	50 per hour	7 50		7 50
F. W. Harris	Engineering draughtsman	50 per hour	8 50		8 50
J. H. Kennady	Engineering draughtsman	50 per hour	11 50		11 50
G. M. Quackenbush	Engineering draughtsman	50 per hour	24 50		24 50
H. R. Wickham	Engineering draughtsman	50 per hour	22 50		22 50
R. P. Campbell	Tracer	75 00 per month	675 00		675 00
C. E. Cruger	Tracer	75 00 per month	77 04		77 04
J. S. Heath	Tracer	75 00 per month	715 24		715 24
J. A. Pritchard	Tracer	75 00 per month	27 42		27 42
S. T. Vosburgh	Tracer	75 00 per month	359 68		359 68
Harry P. Condon	Rodman	4 00 per day	1,248 00		1,248 00
A. J. Muench	Rodman	4 00 per day	1,221 50		1,221 50
J. E. Myers	Rodman	4 00 per day	1,278 00	5 80	1,283 80
J. T. O'Hora	Rodman	4 00 per day	1,273 00	256 14	1,529 14
F. E. Reed	Rodman	4 00 per day	1,272 00	33 84	1,305 84
H. J. Richardson	Rodman	4 00 per day	68 00	2 36	70 36
R. H. Sammons	Rodman	4 00 per day	960 00	2 72	962 72
M. C. Barker	Rodman	3 50 per day	549 50	1 17	550 67
R. N. Barrett	Rodman	3 50 per day	366 00	23 83	389 83
L. G. Bayly	Rodman	3 50 per day	276 50		276 50
J. L. Bush	Rodman	3 50 per day	122 50		122 50
H. L. Clark	Rodman	3 50 per day	14 00		14 00
F. E. Doerhoefer	Rodman	3 50 per day	315 00	6 05	321 05
J. E. De Lee	Rodman	3 50 per day	343 00	17 20	360 20
C. E. Dunwoodie	Rodman	3 50 per day	681 00		681 00
A. C. Eaton	Rodman	3 50 per day	413 00	6 82	419 82
E. C. Getty, Jr	Rodman	3 50 per day	752 50		752 50
Warren Gardiner	Rodman	3 50 per day	150 50	7 65	158 15
J. S. Greenough	Rodman	3 50 per day	827 50	73 14	900 64
G. C. Ingersoll	Rodman	3 50 per day	94 50		94 50
G. H. Jones	Rodman	3 50 per day	35 00		35 00
J. N. Keenan	Rodman	3 50 per day	94 50		94 50
E. L. Kimmey	Rodman	3 50 per day	287 00	10 71	297 71
F. J. Kinney	Rodman	3 50 per day	1,113 00	102 41	1,215 41
B. J. Lowenstein	Rodman	3 50 per day	101 50		101 50
L. A. Meron	Rodman	3 50 per day	189 00	4 77	193 77
W. P. Nichols	Rodman	3 50 per day	1,011 50	165 64	1,177 14
David Noonan	Rodman	3 50 per day	353 50	10 57	364 07
J. H. Rutledge	Rodman	3 50 per day	1,092 00	3 66	1,095 66
J. L. Sawyer	Rodman	3 50 per day	161 00		161 00
J. S. Scanlon	Rodman	3 50 per day	49 00	5 46	54 46
A. G. Slatcher	Rodman	3 50 per day	147 00	5 71	152 71
D. D. Thomson	Rodman	3 50 per day	231 00	3 98	234 98
D. J. Tonkonogy	Rodman	3 50 per day	542 50	13 50	556 00
Harry H. Tripp	Rodman	3 50 per day	175 00	1 98	176 98
Lee Walker	Rodman	3 50 per day	1,092 00	2 73	1,094 73
C. R. Waters	Rodman	3 50 per day	21 00		21 00
J. B. Whipple	Rodman	3 50 per day	94 50		94 50
R. H. Wiswell	Rodman	3 50 per day	178 50		178 50
R. D. Cooper	Chainman	3 00 per day	204 00		204 00
H. L. Felch	Chainman	3 00 per day	271 00		271 00
W. D. Hildreth	Chainman	3 00 per day	192 00	44 34	236 34

Improvement of Public Highways — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
E. J. Kirk	Chainman	$3 00 per day	$786 50	$27 90	$814 40
W. M. Steeve	Chainman	3 00 per day	192 50	5 48	197 98
C. E. Burleigh	Chainman	2 50 per day	180 00	5 67	185 67
E. H. Leggett	Chainman	2 50 per day	105 00	47 20	152 20
F. H. Macy	Chainman	2 50 per day	170 00	76 76	246 76
H. B. Parker	Chainman	2 50 per day	660 50	223 94	884 44
A. A. Pearce	Chainman	2 50 per day	315 00	12 00	327 00
H. E. Relves	Chainman	2 50 per day	514 00	....	514 00
L. P. Stutz	Chainman	2 50 per day	107 50	4 72	112 22
H. T. Tuthill	Chainman	2 50 per day	32 50	12 27	44 77
G. A. Abbott	Laborer	2 00 per day	22 00	....	22 00
F. M. Abeel	Laborer	2 00 per day	120 00	....	120 00
A. J. Allen	Laborer	2 00 per day	618 00	....	618 00
W. L. Almy	Laborer	2 00 per day	42 00	....	42 00
J. K. Alverson	Laborer	2 00 per day	376 00	....	376 00
L. F. Amsden	Laborer	2 00 per day	204 00	....	204 00
A. Armstrong	Laborer	2 00 per day	114 00	....	114 00
D. Ashton	Laborer	2 00 per day	84 00	....	84 00
S. S. Backes	Laborer	2 00 per day	290 00	....	290 00
J. L. Banker	Laborer	2 00 per day	258 00	....	258 00
H. J. Barton	Laborer	2 00 per day	140 00	....	140 00
Alex Bills	Laborer	2 00 per day	114 00	....	114 00
E. Bennett	Laborer	2 00 per day	206 00	....	206 00
C. F. Bidgood	Laborer	2 00 per day	94 00	....	94 00
R. W. Bissell	Laborer	2 00 per day	314 00	....	314 00
John Blute	Laborer	2 00 per day	244 00	....	244 00
Julius Behrer	Laborer	2 00 per day	244 00	2 96	246 96
A. H. Black	Laborer	2 00 per day	104 00	....	104 00
Ira M. Black	Laborer	2 00 per day	50 00	....	50 00
L. A. Boughton	Laborer	2 00 per day	84 00	....	84 00
W. A. Boyes	Laborer	2 00 per day	136 00	....	136 00
F. Buhles	Laborer	2 00 per day	16 00	....	16 00
S. N. Bulloch	Laborer	2 00 per day	108 00	....	108 00
C. E. Bushnell	Laborer	2 00 per day	276 00	....	276 00
S. W. Budlong	Laborer	2 00 per day	10 00	....	10 00
J. B. Burke	Laborer	2 00 per day	242 00	....	242 00
H. E. Burke	Laborer	2 00 per day	604 00	....	604 00
J. T. Bradley	Laborer	2 00 per day	154 00	....	154 00
John Bradley	Laborer	2 00 per day	50 00	....	50 00
M. J. Byington	Laborer	2 00 per day	84 00	....	84 00
J. J. Brennon	Laborer	2 00 per day	201 00	....	201 00
J. J. Brown	Laborer	2 00 per day	302 00	....	302 00
D. J. Brown	Laborer	2 00 per day	594 00	....	594 00
L. Briggs	Laborer	2 00 per day	28 00	....	28 00
J. J. Britt	Laborer	2 00 per day	58 00	....	58 00
Austin Clare	Laborer	2 00 per day	42 00	26 28	68 28
C. O. Conklin	Laborer	2 00 per day	302 00	....	302 00
F. D. W. Connelly	Laborer	2 00 per day	530 00	....	530 00
S. C. Clobridge	Laborer	2 00 per day	126 00	....	126 00
M. J. Connors	Laborer	2 00 per day	16 00	9 00	25 00
M. J. Cotter	Laborer	2 00 per day	62 00	....	62 00
T. H. Clancey	Laborer	2 00 per day	390 00	....	390 00
A. F. Crosby	Laborer	2 00 per day	82 00	....	82 00
L. F. Cashman	Laborer	2 00 per day	178 00	....	178 00
T. J. Cusack	Laborer	2 00 per day	212 00	....	212 00
Edward Connors	Laborer	2 00 per day	286 00	...	286 00
J. Cavanaugh	Laborer	2 00 per day	168 00	....	168 00
H. R. Caine	Laborer	2 00 per day	344 00	1 82	345 82
J. P. Cregg	Laborer	2 00 per day	68 00	....	68 00
P. C. Connors	Laborer	2 00 per day	170 00	....	170 00
C. L. Codding	Laborer	2 00 per day	84 00	....	84 00
Chas. Coyle	Laborer	2 00 per day	234 00	....	234 00
J. E. Collins	Laborer	2 00 per day	68 00	....	68 00
P. Craw	Laborer	2 00 per day	54 00	....	54 00
J. J. Cox	Laborer	2 00 per day	202 00	....	202 00
L. L. Crozier	Laborer	2 00 per day	72 00	....	72 00
J. J. Craven	Laborer	2 00 per day	232 00	....	232 00
E. J. Collins	Laborer	2 00 per day	92 00	....	92 00
A. Conning	Laborer	2 00 per day	124 00	....	124 00
Michael Cann	Laborer	2 00 per day	10 00	....	10 00
J. Crooks	Laborer	2 00 per day	134 00	....	134 00
J. W. Child	Laborer	2 00 per day	24 00	....	24 00
W. B. Collins	Laborer	2 00 per day	102 00	26 03	128 03
T. W. Carpenter	Laborer	2 00 per day	82 00	2 98	84 98

Improvement of Public Highways — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
C. S. Caswell	Laborer	$2 00 per day	$30 00		$30 00
Dennis Connor	Laborer	2 00 per day	206 00		206 00
O. V. Crounse	Laborer	2 00 per day	286 00		286 00
J. B. Carroll	Laborer	2 00 per day	38 00		38 00
James Coffee	Laborer	2 00 per day	170 00		170 00
T. V. Costello	Laborer	2 00 per day	158 00		158 00
G. W. Craige	Laborer	2 00 per day	50 00		50 00
G. J. Duggan	Laborer	2 00 per day	622 00		622 00
J. C. Duggan	Laborer	2 00 per day	638 00		638 00
T. J. Donahoe	Laborer	2 00 per day	144 00		144 00
W. Dickinson	Laborer	2 00 per day	170 00		170 00
A. R. Downing	Laborer	2 00 per day	16 00		16 00
P. Dexheimer	Laborer	2 00 per day	278 00		278 00
C. H. Darke	Laborer	2 00 per day	491 00		491 00
Michael Donahue	Laborer	2 00 per day	176 00		176 00
J. R. Draper	Laborer	2 00 per day	398 00		398 00
J. W. Diamond	Laborer	2 00 per day	282 00		282 00
George Diel	Laborer	2 00 per day	278 00		278 00
Wm. Dotee, Jr.	Laborer	2 00 per day	88 00		88 00
John Donavan	Laborer	2 00 per day	168 00		168 00
Joseph Donavan	Laborer	2 00 per day	122 00		122 00
John Donovan	Laborer	2 00 per day	134 00		134 00
W. P. Deevey	Laborer	2 00 per day	208 00		208 00
Ray E. Demming	Laborer	2 00 per day	28 00		28 00
E. O. Dewing	Laborer	2 00 per day	84 00		84 00
G. de Bellefroid	Laborer	2 00 per day	46 00	$2 05	48 05
H. B. G. De Mont	Laborer	2 00 per day	108 00		108 00
G. I. Doty	Laborer	2 00 per day	50 00		50 00
S. C. Denby	Laborer	2 00 per day	86 00	45 71	131 71
H. C. England	Laborer	2 00 per day	252 00		252 00
W. G. Edgerton	Laborer	2 00 per day	260 00		260 00
Joseph Eyes	Laborer	2 00 per day	322 00		322 00
H. E. Ensign	Laborer	2 00 per day	34 00		34 00
W. E. Everitt	Laborer	2 00 per day	26 00		26 00
E. A. Faille	Laborer	2 00 per day	626 00	52 43	768 43
M. I. Franklin	Laborer	2 00 per day	246 00		246 00
P. L. Fritz	Laborer	2 00 per day	380 00		380 00
E. J. Flanigan	Laborer	2 00 per day	394 00		394 00
W. C. Fox	Laborer	2 00 per day	230 00		230 00
John Fields	Laborer	2 00 per day	252 00		252 00
Delos Finster	Laborer	2 00 per day	256 00		256 00
Stephen Feenan	Laborer	2 00 per day	48 00		48 00
C. J. Gibson	Laborer	2 00 per day	144 00		144 00
J. W. Gibbons	Laborer	2 00 per day	310 00		310 00
L. L. Gowdy	Laborer	2 00 per day	90 00	55 65	145 65
J. J. Glynn	Laborer	2 00 per day	354 00		354 00
Thomas Gleason	Laborer	2 00 per day	302 00		302 00
W. F. Green	Laborer	2 00 per day	314 00		314 00
G. A. Greene	Laborer	2 00 per day	186 00		186 00
H. H. Giles	Laborer	2 00 per day	258 00		258 00
W. H. Gavigan	Laborer	2 00 per day	424 00		424 00
W. F. Gaffney	Laborer	2 00 per day	276 00		276 00
H. Graves	Laborer	2 00 per day	76 00		76 00
W. S. Gray	Laborer	2 00 per day	278 00		278 00
A. Greenwald	Laborer	2 00 per day	260 00		260 00
H. F. Gabriels	Laborer	2 00 per day	60 00		60 00
Cristy Graham	Laborer	2 00 per day	104 00		104 00
M. Goldsmith	Laborer	2 00 per day	38 00		38 00
F. I. Gonyo	Laborer	2 00 per day	50 00		50 00
J. T. Gallagher	Laborer	2 00 per day	104 00		104 00
H. K. Husted	Laborer	2 00 per day	132 00		132 00
D. A. Hogeboom	Laborer	2 00 per day	282 00		282 00
C. W. Hanaburgh	Laborer	2 00 per day	216 00		216 00
J. H. Haver	Laborer	2 00 per day	278 00		278 00
A. E. Hannebrook	Laborer	2 00 per day	120 00		120 00
Martin Hagen	Laborer	2 00 per day	414 00	29 98	443 98
C. Hussey	Laborer	2 00 per day	176 00		176 00
Wm. Hanley	Laborer	2 00 per day	164 00		164 00
Frank Hester	Laborer	2 00 per day	216 00		216 00
A. W. Hollenbeck	Laborer	2 00 per day	258 00		258 00
Seymour Heyck	Laborer	2 00 per day	256 00		256 00
D. J. Hartnett	Laborer	2 00 per day	244 00		244 00
A. E. Hoyt, Jr.	Laborer	2 00 per day	64 00		64 00
John Hughes	Laborer	2 00 per day	158 00		158 00

Improvement of Public Highways — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Eph Herrick	Laborer	$2 00 per day	$168 00	......	$168 00
F. Hildreth	Laborer	2 00 per day	114 00	......	114 00
Silas Hilton	Laborer	2 00 per day	276 00	......	276 00
E. P. Hillson	Laborer	2 00 per day	32 00	......	32 00
John Hazelton	Laborer	2 00 per day	200 00	......	200 00
George Hess	Laborer	2 00 per day	54 00	......	54 00
J. T. Hulihan	Laborer	2 00 per day	60 00	......	60 00
A. G. Horn	Laborer	2 00 per day	598 00	$3 12	601 12
Edward Hill	Laborer	2 00 per day	120 00	......	120 00
G. C. Hill	Laborer	2 00 per day	60 00	......	60 00
J. F. Homeyer	Laborer	2 00 per day	70 00	......	70 00
T. J. Hillary	Laborer	2 00 per day	48 00	......	48 00
J. J. Hoben	Laborer	2 00 per day	20 00	......	20 00
A. Hughes	Laborer	2 00 per day	62 00	......	62 00
C. Haley	Laborer	2 00 per day	104 00	......	104 00
S. Ives	Laborer	2 00 per day	94 00	......	94 00
F. Isaacs	Laborer	2 00 per day	348 00	......	348 00
E. A. Johnson	Laborer	2 00 per day	184 00	......	184 00
W. M. Johnson	Laborer	2 00 per day	194 00	......	194 00
E. Keller	Laborer	2 00 per day	116 00	......	116 00
C. Kelleher	Laborer	2 00 per day	274 00	......	274 00
W. J. Kennedy	Laborer	2 00 per day	20 00	......	20 00
F. D. Kelly	Laborer	2 00 per day	262 00	......	262 00
P. P. Kelly	Laborer	2 00 per day	112 00	......	112 00
B. H. Koltzerwitz	Laborer	2 00 per day	186 00	......	186 00
W. T. Kirby	Laborer	2 00 per day	262 00	......	262 00
Joseph Karr	Laborer	2 00 per day	8 00	......	8 00
W. F. Kraft	Laborer	2 00 per day	136 00	......	136 00
Ray Kirkpatrick	Laborer	2 00 per day	50 00	......	50 00
J. J. Keegan	Laborer	2 00 per day	132 00	......	132 00
J. L. Kehoe	Laborer	2 00 per day	386 00	......	386 00
D. C. Kline	Laborer	2 00 per day	182 00	......	182 00
H. J. Kline	Laborer	2 00 per day	40 00	5 03	45 03
C. Kuhmor	Laborer	2 00 per day	70 00	......	70 00
J. M. Kells	Laborer	2 00 per day	138 00	......	138 00
T. F. Kiley	Laborer	2 00 per day	192 00	......	192 00
A. P. Lynch	Laborer	2 00 per day	614 00	4 63	618 63
John Loughran	Laborer	2 00 per day	272 00	......	272 00
John Loughran	Laborer	2 00 per day	88 00	......	88 00
D. Lockwood	Laborer	2 00 per day	164 00	......	164 00
S. Lodewick	Laborer	2 00 per day	230 00	......	230 00
E. N. Langdon	Laborer	2 00 per day	98 00	......	98 00
M. Lang	Laborer	2 00 per day	314 00	......	314 00
R. C. Lewis	Laborer	2 00 per day	58 00	......	58 00
L. J. Ludwig	Laborer	2 00 per day	216 00	42 90	258 90
C. Leggett	Laborer	2 00 per day	440 00	......	440 00
J. Levellery	Laborer	2 00 per day	88 00	......	88 00
M. Livingston	Laborer	2 00 per day	76 00	......	76 00
H. Lake	Laborer	2 00 per day	282 00	......	282 00
G. Lanahan	Laborer	2 00 per day	166 00	......	166 00
F. F. Ludden	Laborer	2 00 per day	98 00	......	98 00
J. F. Lyon	Laborer	2 00 per day	120 00	......	120 00
E. A. MacCollouch	Laborer	2 00 per day	276 00	......	276 00
H. MacFarlane	Laborer	2 00 per day	232 00	......	232 00
J. F. McCall	Laborer	2 00 per day	36 00	......	36 00
C. McNeil	Laborer	2 00 per day	206 00	......	206 00
H. J. McMulkin	Laborer	2 00 per day	36 00	......	36 00
W. H. McAuliff	Laborer	2 00 per day	306 00	......	306 00
T. P. McEvoy	Laborer	2 00 per day	336 00	47 00	383 00
O. A. McCabe	Laborer	2 00 per day	290 00	......	290 00
J. H. McCabe	Laborer	2 00 per day	270 00	......	270 00
G. McKenna	Laborer	2 00 per day	56 00	......	56 00
M. McCann	Laborer	2 00 per day	152 00	......	152 00
J. McCarthy	Laborer	2 00 per day	272 00	25 00	297 00
W. D. McKenna	Laborer	2 00 per day	172 00	......	172 00
J. C. McElroy	Laborer	2 00 per day	222 00	......	222 00
F. F. McGaugnnea	Laborer	2 00 per day	60 00	......	60 00
A. McMartin	Laborer	2 00 per day	410 00	......	410 00
J. E. McChesney	Laborer	2 00 per day	156 00	......	156 00
T. J. McGee	Laborer	2 00 per day	376 00	22 50	398 50
J. C. McGee	Laborer	2 00 per day	300 00	60 47	360 47
F. McDonald	Laborer	2 00 per day	254 00	......	254 00
Wm. McCarthy	Laborer	2 00 per day	136 00	......	136 00
F. W. McSorley	Laborer	2 00 per day	180 00	......	180 00
B. W. Mosher	Laborer	2 00 per day	194 00	......	194 00

Improvement of Public Highways — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
J. J. Mulligan	Laborer	$2 00 per day	$140 00		$140 00
F. J. Mealey	Laborer	2 00 per day	14 00		14 00
C. H. Millard	Laborer	2 00 per day	50 00		50 00
T. F. Mooney	Laborer	2 00 per day	72 00		72 00
T. Murphy	Laborer	2 00 per day	24 00		24 00
E. J. Martin	Laborer	2 00 per day	284 00		284 00
J. H. Maloney	Laborer	2 00 per day	302 00		302 00
T. E. Mullin	Laborer	2 00 per day	278 00		278 00
F. E. Moore	Laborer	2 00 per day	244 00	$23 55	267 55
Wm. Mahoney	Laborer	2 00 per day	276 00		276 00
B. E. Murray	Laborer	2 00 per day	318 00	2 10	320 10
G. H. Morrley	Laborer	2 00 per day	200 00		200 00
A. J. Miles	Laborer	2 00 per day	278 00		278 00
A. J. Mantica	Laborer	2 00 per day	162 00	5 84	167 84
M. H. Mallineau	Laborer	2 00 per day	84 00		84 00
Thomas Mesick	Laborer	2 00 per day	192 00		192 00
V. Markle	Laborer	2 00 per day	306 00		306 00
D. J. Minahan	Laborer	2 00 per day	314 00		314 00
J. Mitchell	Laborer	2 00 per day	340 00		340 00
E. B. Mesick	Laborer	2 00 per day	140 00		140 00
A. Mathies	Laborer	2 00 per day	398 00		398 00
G. C. Newbury	Laborer	2 00 per day	60 00		60 00
H. E. Nausbaum	Laborer	2 00 per day	128 00		128 00
John Ostrander	Laborer	2 00 per day	194 00		194 00
D. I. O'Leary	Laborer	2 00 per day	34 00	1 50	35 50
J. W. O'Neill	Laborer	2 00 per day	398 00		398 00
P. O'Brien	Laborer	2 00 per day	28 00		28 00
P. J. O'Reilly	Laborer	2 00 per day	278 00		278 00
M. O'Keefe	Laborer	2 00 per day	322 00		322 00
G. Ortis	Laborer	2 00 per day	308 00		308 00
R. Owens	Laborer	2 00 per day	128 00		128 00
E. G. Pugh	Laborer	2 00 per day	74 00		74 00
G. F. Polnan	Laborer	2 00 per day	8 00		8 00
H. P. Pitcher	Laborer	2 00 per day	358 00		358 00
L. Paige	Laborer	2 00 per day	350 00	5 66	355 66
S. Page	Laborer	2 00 per day	22 00		22 00
J. E. Peebles	Laborer	2 00 per day	146 00		146 00
F. M. Pruyn	Laborer	2 00 per day	394 00		394 00
M. T. Palmer	Laborer	2 00 per day	100 00		100 00
E. J. Patterson	Laborer	2 00 per day	72 00		72 00
V. B. Patterson	Laborer	2 00 per day	624 00		624 00
J. F. Parkhurst	Laborer	2 00 per day	288 00		288 00
H. Palmer	Laborer	2 00 per day	230 00		230 00
Wm. Pease	Laborer	2 00 per day	94 00		94 00
H. S. Parsons	Laborer	2 00 per day	162 00		162 00
John Purcell	Laborer	2 00 per day	46 00		46 00
R. A. Prescott	Laborer	2 00 per day	118 00		118 00
J. P. Reis	Laborer	2 00 per day	368 00		368 00
M. D. Rice	Laborer	2 00 per day	142 00		142 00
E. R. S. Reeder	Laborer	2 00 per day	20 00		20 00
W. J. Ryan	Laborer	2 00 per day	24 00		24 00
E. D. Riley	Laborer	2 00 per day	284 00	4 30	288 30
B. Richardson	Laborer	2 00 per day	50 00		50 00
T. Rattoon	Laborer	2 00 per day	612 00		612 00
E. H. Robinson	Laborer	2 00 per day	260 00		260 00
A. B. Roberts	Laborer	2 00 per day	304 00		304 00
J. J. Ryan	Laborer	2 00 per day	14 00		14 00
G. Rogers	Laborer	2 00 per day	106 00		106 00
J. H. Roney	Laborer	2 00 per day	286 00		286 00
A. A. Rockwell	Laborer	2 00 per day	84 00		84 00
E. D. Ransom	Laborer	2 00 per day	84 00		84 00
J. H. Reynolds	Laborer	2 00 per day	100 00		100 00
J. P. Reckord	Laborer	2 00 per day	204 00		204 00
Chas. Riley	Laborer	2 00 per day	104 00		104 00
W. H. Ronald	Laborer	2 00 per day	22 00		22 00
H. W. Ryan	Laborer	2 00 per day	14 00		14 00
E. P. Ramsay	Laborer	2 00 per day	168 00		168 00
A. Stewart	Laborer	2 00 per day	30 00		30 00
W. E. Smith	Laborer	2 00 per day	120 00		120 00
J. T. Smith	Laborer	2 00 per day	110 00		110 00
S. E. Smith	Laborer	2 00 per day	206 00		206 00
R. H. Smith	Laborer	2 00 per day	406 00		406 00
C. E. Smith	Laborer	2 00 per day	46 00		46 00
Benson Smith	Laborer	2 00 per day	152 00		152 00
Fred T. Smith	Laborer	2 00 per day	204 00		204 00

Improvement of Public Highways — (Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
T. F. Smith	Laborer	$2 00 per day	$34 00		$34 00
T. J. Sheridan	Laborer	2 00 per day	78 00		78 00
C. F. Stover	Laborer	2 00 per day	278 00		278 00
F. M. Southerland	Laborer	2 00 per day	278 00		278 00
G. F. Small	Laborer	2 00 per day	160 00		160 00
J. Schumann, Jr	Laborer	2 00 per day	112 00	$84 00	196 00
E. A. Sackrider	Laborer	2 00 per day	218 00		218 00
Floyd T. Sheldon	Laborer	2 00 per day	230 00		230 00
Chas. B. Seib	Laborer	2 00 per day	230 00		230 00
John Shepard	Laborer	2 00 per day	106 00		106 00
A. J. Sherlock	Laborer	2 00 per day	230 00		230 00
C. G. Schuyler	Laborer	2 00 per day	84 00		84 00
J. R. Shea	Laborer	2 00 per day	218 00		218 00
J. P. Seamon	Laborer	2 00 per day	260 00	11 30	271 30
J. J. Sherry	Laborer	2 00 per day	34 00		34 00
C. S. Sterling	Laborer	2 00 per day	10 00		10 00
G. H. Schufelt	Laborer	2 00 per day	64 00		64 00
Louis Stern	Laborer	2 00 per day	84 00		84 00
L. Sterne	Laborer	2 00 per day	54 00		54 00
George Stark	Laborer	2 00 per day	224 00		224 00
F. A. Sweet	Laborer	2 00 per day	170 00		170 00
J. H. Schram	Laborer	2 00 per day	314 00		314 00
J. Sullivan	Laborer	2 00 per day	84 00		84 00
E. Snell	Laborer	2 00 per day	302 00		302 00
A. C. Snyder	Laborer	2 00 per day	42 00		42 00
C. Stock	Laborer	2 00 per day	276 00		276 00
E. Shackleton	Laborer	2 00 per day	96 00		96 00
Harry Town	Laborer	2 00 per day	372 00		372 00
J. J. Tobin	Laborer	2 00 per day	76 00		76 00
J. B. Traver	Laborer	2 00 per day	126 00		126 00
L. Tucker	Laborer	2 00 per day	138 00		138 00
F. A. Taylor	Laborer	2 00 per day	116 00		116 00
J. Tierney	Laborer	2 00 per day	156 00		156 00
J. D. Thievot	Laborer	2 00 per day	24 00		24 00
T. Tracey	Laborer	2 00 per day	42 00		42 00
Ezra A. Traver	Laborer	2 00 per day	252 00		252 00
G. H. Tobias	Laborer	2 00 per day	124 00		124 00
F. Van Valkenburg	Laborer	2 00 per day	88 00		88 00
Luke Van Valkenburg	Laborer	2 00 per day	182 00	28 84	210 84
A. Ury	Laborer	2 00 per day	46 00		46 00
B. Wagar	Laborer	2 00 per day	88 00		88 00
B. Watson	Laborer	2 00 per day	228 00		228 00
W. T. Whitehead	Laborer	2 00 per day	274 00		274 00
C. A. Wilbur	Laborer	2 00 per day	32 00		32 00
F. Wilson	Laborer	2 00 per day	84 00		84 00
F. H. Willets	Laborer	2 00 per day	152 00		152 00
Jef Warren	Laborer	2 00 per day	30 00		30 00
J. B. Walsh	Laborer	2 00 per day	94 00		94 00
G. W. Ward	Laborer	2 00 per day	76 00		76 00
A. F. Wilson	Laborer	2 00 per day	54 00		54 00
J. B. Wallace	Laborer	2 00 per day	26 00		26 00
C. A. Young	Laborer	2 00 per day	50 00		50 00
H. D. Young	Laborer	2 00 per day	280 00		280 00
			$224,064 89	$31,632 38	$255,697 27
Incidental Expenses.					
Stationery and printing				$2,158 71	
Livery				15,449 60	
Fuel and light				276 01	
Postage				332 06	
Office rent				2,288 50	
Telephone and telegraph				803 23	
Miscellaneous				7,047 10	
					28,346 21
Total					$284,043 48

Maintenance and Repairs of Improved Public Highways.

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906; Chapter 686, Laws of 1906; Chapter 170, Laws of 1907.

ROAD NO.	Name of road.	Town.	County.	Construction.	Engineering.	Total.
7	Delaware Turnpike, section 1	Bethlehem	Albany	$2,093 30	$157 56	$2,250 86
10	Troy and Brunswick, section 1	Brunswick	Rensselaer	899 67	....	899 67
11	Troy and Greenbush, section 1	North Greenbush	Rensselaer	53 10	....	53 10
14	Frankfort	Frankfort	Herkimer	539 21	....	539 21
16	Ulster–Delaware, section 1	Shandaken	Ulster	238 36	....	238 36
18	Ardsley–Elmsford, section 1	Greenburg	Westchester	1,154 74	26 45	1,181 19
19	Mamaroneck–White Plains	Mamaroneck and Scarsdale	Westchester	....	52 50	52 50
20	White Plains–Cross Road	North Castle	Westchester	4,992 91	352 99	5,345 90
22	Loudon	Colonie	Albany	1,301 74	159 45	1,461 19
25	Troy and Brunswick	Brunswick	Rensselaer	2,770 61	21 93	2,792 54
26	Troy and Greenbush, section 1	North Greenbush	Rensselaer	483 96	64 65	548 61
31	Ulster–Delaware, section 3	Shandaken	Ulster	216 71	12 50	229 21
33	Gloversville–Mayfield	Johnstown and Mayfield	Fulton	194 38	....	194 38
34	Ardsley–Elmsford, section 2	Greenburg and Mt. Pleasant	Westchester	....	12 50	12 50
35	White Plains–Armonk	North Castle	Westchester	1,690 75	49 53	1,740 28
37	Saugerties–Woodstock, section 1	Woodstock	Ulster	300 00	19 72	319 72
38	Saugerties–Woodstock, section 2	Saugerties	Ulster	1,008 58	20 72	1,029 30
39	Waterford, section 1	Waterford	Saratoga	877 08	175 26	1,052 34
41	Delaware Turnpike, section 2	Bethlehem	Albany	3,181 69	187 64	3,369 33
42	Newburg–Woodbury	New Windsor, Cornwall and Woodbury	Orange	2,260 60	218 60	2,479 20
43	Cochecton Turnpike, section 2	Newburg and Montgomery	Orange	851 58	22 26	873 84
44	Goshen–Florida	Goshen and Warwick	Orange	1,195 16	190 47	1,385 63
45	Middletown–Pine Bush	Crawford and Wallkill	Orange	118 28	14 00	132 28
46	Turners–Monroe	Monroe	Orange	18 00	20 60	38 60
50	Armonk–Mt. Kisco	North Castle and New Castle	Westchester	2,145 23	134 15	2,279 38
51	Mt. Kisco–Bedford	Bedford	Westchester	5,986 64	345 96	6,332 60
52	Unionville–McKeel's Corners	Mt. Pleasant	Westchester	....	132 18	132 18
55	Hoags Corners	Nassau	Rensselaer	....	12 00	12 00
58	Glens Falls–Saratoga	Moreau	Saratoga	651 33	....	651 33
59	Waterford, section 2	Halfmoon	Saratoga	3,550 03	202 12	3,752 15
64	Walden–Scott's Corners	Montgomery	Orange	100 70	2 00	102 70
65	Montgomery–Goshen	Montgomery, Hamptonburg and Goshen	Orange	438 55	7 64	446 19
77	Albia–Wynantskill	Brunswick and North Greenbush	Rensselaer	12,863 08	619 20	13,482 28
85	Fort Edward–Sandy Hill	Fort Edward	Washington	17 85	....	17 85
92	Delmar–Slingerland	Bethlehem	Albany	102 13	57 25	159 38

93	Florida–Warwick	Warwick	Orange	777 48	9 15	786 63
95	Middletown–Goshen	Wawayanda, Wallkill and Goshen	Orange	56 84	36 00	92 84
97	Shunpike	White Creek	Washington	659 35	236 24	895 59
102	Barracks	East Greenbush	Rensselaer	370 94	135 51	506 45
103	Granville–Middle Granville	Granville	Washington	482 61	....	482 61
104	Granville–Troy Stage	Granville	Washington	1,036 17	8 20	1,044 37
108	West Mohawk River	Amsterdam	Montgomery	1,328 71	160 70	1,489 41
113	Cochecton Turnpike, section 1	Newburg	Orange	1,148 60	24 75	1,173 35
115	Central Valley–Turner, section 1	Woodbury and Monroe	Orange	65 80	22 60	88 40
116	Kingston–Rifton	Ulster and Esopus	Ulster	1,237 13	39 35	1,276 48
117	Ulster–Delaware, section 2	Shandaken	Ulster	78 00	67 02	145 02
119	Loudon, section 2	Colonie	Albany	2,362 21	159 45	2,521 66
137	Plattsburg–Keeseville, section 2	Plattsburg and Peru	Clinton	1,342 06	66 50	1,408 56
138	Plattsburg–Mooers, section 1	Beekmantown and Chazy	Clinton	1,103 97	21 72	1,125 69
142	Saugerties–Woodstock, section 3	Saugerties	Ulster	485 38	....	485 38
145	Delaware River	Delhi	Delaware	378 73	....	378 73
153	Newburg–Campbell Hall	Newburg, New Windsor and Hamptonburg	Orange	584 43	7 64	592 07
155	Fonda, West	Mohawk	Montgomery	204 20	1 50	205 70
156	Chester–Goshen	Chester and Goshen	Orange	856 40	192 30	1,048 70
159	Middletown–Slate Hill	Wawayanda	Orange	73 70	10 00	83 70
161	Newburg–Shawangunk	Newburg	Orange	97 53	33 91	131 44
162	Oneonta	Oneonta	Otsego	267 58	7 42	275 00
168	Broadway–Fort Hunter	Rotterdam	Schenectady	174 02	....	174 02
178	Delaware Turnpike, section 3	Bethlehem and New Scotland	Albany	271 38	48 00	319 38
193	River	Bethlehem	Albany	3,452 90	377 74	3,830 64
194	Sand Lake–Troy	Sand Lake and Poestenkill	Rensselaer	66 50	....	66 50
198	Delaware Turnpike, section 4	New Scotland and Berne	Albany	772 79	27 25	800 04
199	Delaware Turnpike, section 5	Westerlo and Rensselaerville	Albany	735 35	51 25	786 60
219	Richfield Springs–Cherry Valley	Richfield Springs	Otsego	283 79	9 08	292 87
220	Worcester	Worcester	Otsego	....	8 52	8 52
221	Edmeston	Edmeston	Otsego	87 12	25 75	112 87
222	Hughsonville	Wappinger	Dutchess	239 69	....	239 69
223	South	Poughkeepsie	Dutchess	358 79	....	358 79
				$73,736 10	$5,079 38	$78,815 48
	Engineering expenses, Division and Residency offices					126 29
	Instruments, tools and appliances					2,200 00
	Total maintenance expenditures					$81,141 77

"Money System" Repairs of Highways.

Chapter 700, Laws of 1905; Chapter 686, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Frank D. Lyon	Special examiner of highways	$8 00 per day	$711 00	....	$711 00
Stephen Ryan	Special examiner of highways	12 00 per day	2,181 00	$430 46	2,611 46
Chas. F. Chamberlain	Supervisor of highways	5 00 per day	1,565 00	1,177 15	2,742 15
Ira P. Cribb	Supervisor of highways	5 00 per day	1,565 00	887 59	2,452 59
Samuel Grennon	Supervisor of highways	5 00 per day	785 00	560 29	1,345 29
F. J. McGuire	Supervisor of highways	5 00 per day	785 00	552 79	1,337 79
Bernard M. Patten	Supervisor of highways	5 00 per day	785 00	627 83	1,412 83
Chas. B. Perry	Supervisor of highways	5 00 per day	1,565 00	1,071 99	2,636 99
J. C. Van Arsdale	Supervisor of highways	5 00 per day	785 00	475 93	1,260 93
Jesse C. Patrick	Inspector of highways	4 50 per day	....	31 88	31 88
C. A. Hulbert	Inspector of highways	3 50 per day	720 50	....	720 50
John Gick	Auditor of highway accounts	4 00 per day	1,238 50	769 79	2,008 29
E. M. Howland	Auditor of highway accounts	4 00 per day	1,238 50	27 88	1,266 38
Valentina Brother	Stenographer	83 33 per month	949 98	....	949 98
Elizabeth A. Crowl	Stenographer	83 33 per month	....	52 77	52 77
M. G. Harington	Temporary stenographer	75 00 per month	150 00	....	150 00
May Sullivan	Temporary stenographer	75 00 per month	29 03	....	29 03
Austin Clare	Laborer	2 00 per day	226 00	....	226 00
Robert C. Denegar	Laborer	2 00 per day	498 00	....	498 00
Walter G. Edgerton	Laborer	2 00 per day	50 00	....	50 00
F. F. Freeman	Laborer	2 00 per day	256 00	....	256 00
Robert A. Hall	Laborer	2 00 per day	158 00	....	158 00
			$16,294 28	$6,613 58	$22,907 86

Incidental Expenses.

Stationery and printing	$5,383 10	
Livery	1,436 75	
Postage	357 20	
Telephone and telegraph	148 31	
Miscellaneous	909 85	
		8,235 21
Total		$31,143 07

Bureau of Bridges.

Chapter 686, Laws of 1906; Chapter 578, Laws of 1907.

NAME.	Rank.	Rate of compensation.	Services.
Wm. R. Davis	Chief bridge designer	$325 00 per month	$197 79
Francis E. Blake	Mechanical engineer and draughtsman	175 00 per month	46 67
Edwin A. Brainerd	Bridge designer	175 00 per month	16 94
Lemuel Holmes	Bridge designer	175 00 per month	52 50
H. J. Scheuermann	Bridge designer	175 00 per month	27 50
John Bartholomew	Bridge designer	150 00 per month	217 03
Harlan D. Miller	Bridge designer	150 00 per month	160 48
J. H. B. Altdoerffer	Bridge designer	125 00 per month	119 36
Harry N. Peck	Bridge draughtsman	115 00 per month	115 00
Geo. E. Maynard	Bridge draughtsman	100 00 per month	16 35
Emory E. Brandow	Bridge draughtsman	75 00 per month	7 50
Total	....	....	$977 12

Examination of Monuments and Maps.

Chapter 729, Laws of 1904; Chapter 686, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Merritt Peckham, Jr.	Land clerk			$62 27	$62 27
Chas. T. Crowley	Leveler	$5 00 per day	$117 00		117 00
Mark Nelson	Draughtsman	5 00 per day	40 00		40 00
C. G. Van Alstyne	Laborer	2 00 per day	208 00	245 84	453 84
			$365 00	$308 11	$673 11
Incidental Expenses.					
Livery				$104 25	
Postage				22	
Telephone and telegraph				85	
Miscellaneous				50 06	
					155 38
Total					$828 49

Surveys for State Court of Claims.

Chapter 686, Laws of 1906: Chapter 578, Laws of 1907.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Robert E. Horton	Resident engineer	$2,400 per year	$137 57	$41 09	$178 66
C. Arthur Poole	Resident engineer	2,400 per year	12 91	8 30	21 21
W. R. Gordon	Draughtsman	5 00 per day	150 00		150 00
J. A. O'Connor	Assistant engineer	6 00 per day	774 00	494 26	1,268 26
Thos. A. Hendrickson	Leveler	4 50 per day	18 00	12 67	30 67
J. C. Bell	Rodman	4 00 per day	48 00		48 00
H. P. Condon	Rodman	4 00 per day	32 00		32 00
Frank Roberts	Rodman	4 00 per day	84 00		84 00
L. G. Bayley	Rodman	3 50 per day	59 50		59 50
H. L. Michael	Chainman	3 00 per day	18 00		18 00
A. P. Lynch	Laborer	2 00 per day	42 00		42 00
E. B. Mesick	Laborer	2 00 per day	60 00		60 00
John Mitchell	Laborer	2 00 per day	12 00		12 00
			$1,447 98	$556 32	$2,004 30
Incidental Expenses.					
Livery				$71 40	
Telephone and telegraph				3 19	
Miscellaneous				22 38	
					96 97
Total					$2,101 27

Topographic Survey.

Chapter 686, Laws of 1906; Chapter 578, Laws of 1907.

In Coöperation with United States Geological Survey.

Alpin, Earl F	$18 00
Barnum, L. M	79 57
Beams, C. L	20 00
Brown, P. B	64 00
Chase, F. T	22 50
Cooke, Chas. E	1,219 31
Director U. S. Geological Survey	185 58
Dodge, H	178 83
Dykeman, F. A	35 00
Eastwood, E. M	78 40
Einell, M. N	10 50
Fields, H	15 00
Gilgory, M. M	29 00
Graff, Fred. Jr	85 74
Gregory, M. M	74 62
Gurney, Frank M	134 00
Hafley, C. G	27 00
Houghton, J. B	30 00
Kirby, P. L	28 50
Lawrence, Edward	25 50
McNair, A. F	193 00
Mitchell, Arthur	58 00
Mitchell, J. E	148 00
Morley, W. H. S	95 28
Munroe, Ed. Jr	153 00
Northrup, Frederick B	83 83
Nyce, Ralph	37 50
Pease, Allan W	83 83
Petit, J. W	213 00
Quinn, Theobald M	83 83
Robinson, K. E	44 91
Sammons, J. R	96 50
Semper, C. H	76 66
Smith, Wm	30 00
Sperry, B. A	23 62
Trangott, C. Jay	288 00
Tufts, Wm. O	387 10
Van Arman, Geo. E	26 00
Wait, J. M	50 00
Wilson, H. M	100 00
Wipple, Christopher	25 00
Young, Gilbert	303 39
Young, W. D	66 50
Total	$5,028 00

Hydrographic Survey.

Chapter 686, Laws of 1906; Chapter 578, Laws of 1907.

Armon, Godfrey	$20 00
Brannock, Charles	30 00
Buffham, Charles	15 00
Burrows, H. K	36 00
Carpenter, C. E	30 00
Conron, Edward	3 00
Covert, C. C	625 10
Crain, Robert W	12 00
Dempsey, W. B	25 00
Douglas, John	15 00
Farley, C. M	29 00
Fernalld, John	10 00
Fox, Seymour, Jr	24 00
Frisbee, Jas. J	4 00
Gilbert, J. J	15 00
Hannon, Chris	24 00
Hare, A. C	15 00
Henry, B. C	12 00
Henry, John V	12 00
Hoyt, W. G	84 24
La Rue, Joseph H	24 00
McArthur, Arthur	20 00
McArthur, Frank	7 50
McAstocker, John	30 00

Hydrographic Survey — (Concluded).

Mayhew, A. S.	$25 00
Mohawk Valley Transfer & Storage Co.	42 00
Monroe, Wm. Ray	30 00
Orcutt, D. L.	24 00
Owens, R. J.	15 00
Pulver, David	24 00
Sevaire, Lester	18 00
Shanley, Edward	9 00
Snyder, Edna M.	12 00
Stewart, Eugene	30 00
Stockwell, Harrison H.	12 00
Thomas, Fred	7 50
Van Etten, D. B.	24 00
Wait, C. A.	15 00
Weeks, E. F.	34 99
Weston, Thomas P.	12 00
Wood, Dana M.	99 95
Total	$1,556 28

SUMMARY.

The foregoing tables are summarized as follows:

Ordinary Repairs to Canals.

1.	Erie canal, chapter 683, Laws of 1906	$10,064 17
2.	Champlain canal, chapter 683, Laws of 1906	1,935 83

Construction of Barge Canal.

3.	Head office account, chapter 147, Laws of 1903; chapter 143, Laws of 1905; chapter 172, Laws of 1907	214,236 24
4.	Erie canal, chapter 147, Laws of 1903; chapter 143, Laws of 1905; chapter 172, Laws of 1907	84,028 48
5.	Champlain canal, chapter 147, Laws of 1903; chapter 143, Laws of 1905; chapter 172, Laws of 1907	58,681 94

Improvement of Public Highways.

6.	Improvement of public highways, chapter 115, Laws of 1898	284,043 48
7.	Maintenance and repairs of improved public highways, chapter 115, Laws of 1898; chapter 468, Laws of 1906; chapter 686, Laws of 1906; chapter 170, Laws of 1907	81,141 77
8.	"Money system" repairs of highways, chapter 700, Laws of 1905; chapter 686, Laws of 1906	31,143 07

Bureau of Bridges.

9.	Bureau of bridges, chapter 686, Laws of 1906; chapter 578, Laws of 1907	977 12

Special Surveys.

10.	Examination of monuments and maps, chapter 729, Laws of 1904; chapter 686, Laws of 1906	828 49
11.	Surveys for State Court of Claims, chapter 686, Laws of 1906	2,101 27
12.	Topographic survey, chapter 686, Laws of 1906	5,028 00
13.	Hydrographic survey, chapter 686, Laws of 1906	1,556 28
	Total	$775,766 14

TABLE OF CONTRACTS COMPLETED ON THE EASTERN DIVISION DURING THE FISCAL YEAR ENDING SEPTEMBER 30, 1907.

Improvement of Public Highways.

Chapter 115, Laws of 1898, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Contract price.	Final payment.
Ganung & Hoyt	June 19, 1903	Turk Hill–Putnam county line road, No. 151, Westchester county	$55,200 00	$55,484 26
D. I. Snell & Co.	Nov. 7, 1906	Fonda, east, road, No. 152–A, Montgomery county	3,185 43	3,191 43
The Orange County Road Construction Co.	Sept. 1, 1906	Chester–Goshen road, No. 156–A, Orange county	425 00	597 00
Alonzo Schaupp	Sept. 1, 1906	Northampton road, No. 158, Montgomery county	6,590 00	6,809 63
The Orange County Road Construction Co.	June 18, 1904	Slate Hill–Unionville road, No. 160, Orange county	45,200 00	46,301 05
John H. Gordon	Oct. 16, 1906	Delaware Turnpike road, No. 178–A, Albany county	3,000 00	3,025 00
Alonzo Schaupp	Nov. 7, 1906	Mohawk River Turnpike road, No. 180–A, Montgomery county	892 60	891 50
Joseph Walker	May 29, 1906	River road, No. 193–A, Albany county	4,800 00	7,105 69
Thomas H. Karr	June 23, 1904	Wynantskill–West Sand Lake road, No. 195, Rensselaer county	33,400 00	35,180 18
Edward Rendert	Aug. 18, 1906	East Nassau road, No. 196–A, Rensselaer county	677 50	677 50
William H. Masterson	June 13, 1904	Troy–Poestenkill road, No. 201, Rensselaer county	26,694 12	27,558 34
John Schuman, Jr.	Dec. 13, 1906	Troy–Poestenkill road, No. 201–A, Rensselaer county	2,920 00	2,938 52
John E. Consalus	Dec. 7, 1906	Kingston–Saugerties road, No. 228–A, Ulster county	3,654 00	3,447 50
The Clinton Beckwith Engineering & Contracting Co.	July 9, 1906	Old State road, No. 232, Essex county	18,000 00	18,904 55
The Buckley Construction Co.	July 6, 1906	Old Plank road, No. 249, Fulton county	24,800 00	25,488 74
Andrews Brothers	July 10, 1906	Birch Hill road, No. 270, Nassau county	10,172 69	10,639 88
John H. Gordon	July 3, 1906	Troy–Sand Lake (section 2) road, No. 288, Rensselaer county	14,500 00	15,252 58
Joseph Walker	July 11, 1906	De Graff's Corners–Sherburne's Corners road, No. 300, Montgomery county	9,800 00	9,727 58
The Clinton Beckwith Engineering & Contracting Co.	July 9, 1906	Minaville–Scotch Bush road, No. 301, Montgomery county	15,000 00	14,495 93
D. I. Snell & Co.	July 9, 1906	Fonda–Berryville road, No. 302, Montgomery county	14,320 00	15,848 39
Siver & Gould	July 10, 1906	Colliersville–Emmons road, No. 316, Otsego county	10,716 00	11,667 85
S. B. Van Wagonen	June 30, 1906	Colliersville–Milford Center road, No. 318, Otsego county	16,500 00	17,021 15
The General Construction Co.	July 7, 1906	Pawling–Patterson road, No. 343, Dutchess county	21,915 00	21,787 47
The Lane Construction Corporation	July 9, 1906	Millerton–North East Center road, No. 344, Dutchess county	16,000 00	16,234 01

Alonzo Schaupp	July 2, 1906	Poland–Cold Brook road, No. 360, Herkimer county	3,740 00	3,739 53
James H. Malcolm	July 3, 1906	Guilderland Center–Guilderland road, No. 365, Albany county	14,088 14	14,938 61
Joseph Walker	July 11, 1906	New Scotland–Wolf Hill road, No. 366, Albany county	58,500 00	70,831 66
The Buckley Construction Co.	July 6, 1906	Glenmont–Feura Bush road, No. 367, Albany county	48,460 00	57,706 94
Andrews Brothers	July 10, 1906	Arrandale–Bay View road, No. 434, Nassau county	11,026 26	15,283 67
Peace Brothers	Sept. 1, 1906	South Glenwood–Meeting House road, No. 435, Nassau county	17,500 00	20,374 06
The Lane Construction Corporation	July 9, 1906	Northeast Center–Sharon Station road, No. 534, Dutchess county	31,600 00	31,184 54
Hinman & Sproul	Aug. 28, 1906	Violet Avenue–East Park road, No. 550, Dutchess county	14,999 00	15,578 97
McNamee & Rice	July 10, 1906	Fishkill–Hughsonville road, No. 551, Dutchess county	22,000 00	23,851 91
Jeremiah T. Finch	July 9, 1906	Schenectady–Guilderland road, No. 577, Schenectady county	48,287 00	51,875 79

TABLE OF CONTRACTS PENDING ON THE EASTERN DIVISION, SEPTEMBER 30, 1907.

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Empire Engineering Co.	April 18, 1905	Contract No. 1 (River line) Champlain canal. For excavating the river channel from Northumberland to Fort Miller, and from Crocker's Reef dam to Fort Edward, the construction of Crocker's Reef dam, the approaches to the head and foot of "The Land Line" and other incidental work. Station 9 + 52 to Station 147 + 75 and Station 262 to Station 497 + 35; length, 7.075 miles	$619,846 00	$605,008 40	$256,788 00
Ferguson Contracting Co.	April 3, 1905	Contract No. 2, Erie canal. For the excavation and protection of the sides of the canal from the Mohawk river to a point about one-fourth mile west of the head of Lock No. 3, the construction of Locks Nos. 2 and 3, with the approaches and appertaining parts. Length, 0.91 mile	1,022,640 00	852,330 00	286,893 00
John W. Flynn	May 10, 1905	Contract No. 2–A, Erie canal. For the removal of certain dwellings, barns, stables, shops, out-houses and other structures, their foundations and other accessories, the cleaning out of all vaults and cesspools and disposal of their contents from the site of contract No. 2 (except the "Bush" property)	—4,810 00	—7,550 00	—7,550 00
John W. Flynn	May 10, 1905	Contract No. 2–B, Erie canal. For the removal of the buildings, with their foundations and other accessories, upon the "Mrs. Bush" property upon the site of contract No. 2, and the cleaning out of all vaults and cesspools and disposal of their contents	—1,290 00	—1,005 00	—1,005 00
Sundstrom & Stratton	April 4, 1905	Contract No. 3 (Land Line), Champlain canal. For the excavation of the canal and the protection of its banks from Station 147 + 75, below Lock No. 6, at Fort Miller, to Station 262, above the guard-gate at Crocker's Reef; the construction of Lock No. 6, at Fort Miller, its approaches, the guard-gate and its approaches, the bridge abutments and foundations at Stations 151 + 60, 173 + 18, 213 + 46 and 247 + 50; the removal and re-erection of the present bridge at East street; the change in location of the old Champlain canal and all other incidental work. Length, 2.164 miles	760,576 00	670,497 00	420,156 00

Sundstrom & Stratton	Oct. 3, 1905	Contract No. 3-A, Champlain canal. For the removal of certain dwellings, barns, stables, shops, out-houses and other structures, their foundations and other accessories, the cleaning out of all vaults and cesspools and disposal of their contents, building foundations, for moving house to Parcel No. 148, for excavating cellar and for moving school house on Parcel No. 141, on the site on contract No. 3	—1,615 00	—300 00	—300 00
Groton Bridge Co.	Aug. 10, 1906	Contract No. 7, *Erie canal (Sections 1, 5, 7, and 9), Champlain canal (Section 2)	102,122 70	97,635 20	21,492 00
		For furnishing and erecting in place steel highway bridge superstructures as follows:			
		Eastern Division On contract No. 2—Erie Canal, Section 1. Bridge at Fourth street, Waterford. On contract No. 3—Champlain canal, Section 2. Bridge at Ft. Miller, Station 151+84.54. Bridge at Ridge road, Station 173+18. Payne's Bridge Station 213+10.	33,576 60	32,171 60	17,865 00
		Middle Division On contract No. 4—Erie canal, Section 5. Bridge at Station 6773. Bridge at Station 6886+43.5. Bridge at Sylvan Beach, Station 6939+40. On contract No. 5—Erie canal, Section 7. Bridge at Mosquito Point, Station 5077+76.	39,883 30	38,125 80	....
		Western Division On contract No. 6—Erie canal, Section 9. Buffalo road bridge, Station 2576+14. Lyell road bridge, Station 2631+38. Lee road bridge, Station 2661+64. Spier's road bridge, Station 2729+10.	....	27,337 80	....
Pittsburg Eastern Co.	May 22, 1906	Contract No. 8, Erie canal. For the construction of the following structures on the Mohawk river: Dam 4, Lock 8, at Scotia, Station 1408+86. Dam 5, Lock 9, at Rotterdam, Station 1662+45. Dam 6, Lock 10, at Cranes Village, Station 1987+79, and incidental work appertaining thereto. Length of canal included within the limits of these locks and their approaches, 0.7 mile	1,518,382 00	1,433,817 00	103,446 00
Fort Orange Const. Co.	May 21, 1906	Contract No. 11, Erie canal. For excavating the canal and protecting its sides from Station 220+00 (0.4 mile northwest of the Delaware and Hudson R. R. crossing at Waterford) to Station 305+00 on the Mohawk river (about 1.6 miles below Crescent), including the construction of Locks 4, 5 and 6 and appertaining structures, a highway, masonry for a guard-gate, bridge abutments and other incidental details. **Length of contract**, 1.6 miles	1,671,385 00	1,359,475 00	140,121 00

***Contract No. 7 includes work on Eastern, Middle and Western Divisions.**

TABLE OF CONTRACTS PENDING ON THE EASTERN DIVISION, SEPTEMBER 30, 1907 — (Continued).

Construction of Barge Canal — (Continued).

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Acme Eng. & Contract. Co.	Sept. 10, 1907	Contract No. 14, Erie canal. For dredging a channel in the Mohawk river between the west end of Contract No. 11, Station 305, and a point near upper Mohawk aqueduct, at Rexford Flats, Station 1046; for constructing Dam No. 2, below Crescent aqueduct, Station 305; Dam No. 3 and Lock No. 7, above Vischer's Ferry, Station 839; Dam No. 9 and Lock No. 13, at Yosts, Station 2954; Dam No. 10 and Lock No. 14, at Canajoharie, Station 3370; Dam No. 11 and Lock No. 15, at Fort Plain, Station 3554; Retaining Dam at Mindenville, Station 3865; highway changes; culverts; and incidental work appertaining thereto. Stations 305 to 1046; dredging. Stations 305; 839; 2954; 3370; 3554; 3865; structures. Length, 15 miles.	$2,875,570 00	$2,935,763 00	....
Atlantic, Gulf & Pacific Co	Aug. 9, 1906	Contract No. 15, Champlain canal. For excavating the canal and protecting its sides and constructing Lock No. 11, Dam No. 4, and Lock No. 12, Dam No. 5, and appertaining structures, a spillway, a highway, two masonry culverts, five bridges with their piers and abutments and other incidental details, between Lake Champlain at Whitehall, Station 0–73, and Station 356 on Wood creek, about 0.6 mile north of Comstock's P. O. Length of contract 6.8 miles.	1,380,760 00	1,509,060 00	$91,161 00
United Construction Co.	Dec. 20, 1906	Contract No. 16. For furnishing and erecting in place steel highway bridge superstructures as follows: On Contract No. 11, Erie Canal, Section 1. Bridge at Station 293+10. On contract No. 25, Champlain Canal, Section 3. Comstock's bridge, Station 392+50. Dewey's bridge, Station 468+00. Fort Ann bridge, Station 600+26. Brayton's bridge, Station 687+11. Smith's Basin bridge, Station 806+30. George Henry bridge, Station 914+00. On contract No. 27, Champlain Canal, Section 2. Dunham's Basin bridge, Station 1048+70. East Street bridge, Station 1187+00. Argyle Street bridge, Station 1218+85. Bridge below Lock No. 7.	70,718 00	63,472 00	....

The Scofield Co.	Dec. 29, 1906	Contract No. 17, Erie canal. For the construction of the following structures on the Mohawk River: Dam 7, Lock 11, at Amsterdam, Station 2201 + 46; Dam 8, Lock 12, at Tribes Hill, Station 2443 + 17; and incidental work appertaining thereto. Length of canal included within the limits of these structures and approaches, 0.4 mile	883,926 00	835,725 00	40,167 00
O'Brien & Hoolihan Cont. Co.	Dec. 28, 1906	Contract No. 18, Erie canal. For excavating the canal and protecting its sides between Station 3868 + 26, about 0.5 mile east of Mindenville, and Station 4060 + 00, at Castle Creek; constructing Lock No. 16 with appertaining structures, abutments, and approaches for two bridges, a dive culvert, guard-gate masonry, a retaining dam for stream entrance at Castle Creek, a temporary canal at Mindenville, and other incidental work. Stations 3868 + 26 to 4060 + 00. Length, 3.63 miles	789,440 00	859,460 00	68,787 00
Atlantic, Gulf & Pacific Co.	Nov. 19, 1906	Contract No. 25, Champlain canal. For excavating the canal and protecting its sides, constructing Locks No. 9 and No. 10, necessary spillways, power plants and appertaining structures, bridge substructures and approaches, retaining walls, highways and other incidental details between Station 356, about 0.6 of a mile north of Comstock P. O., Washington county, and Station 1041 + 54, which is also Station 1046 + 16, at Dunham's Basin road, Washington county. Station 356 to Station 1041 + 54. Length, 13.0 miles	1,849,831 00	1,754,236 00	42,894 00
[illegible] Construction Co.	Nov. 23, 1906	Contract No. 27, Champlain canal. For excavating the canal and protecting its sides, constructing Locks No. 7, No. 8, and Junction Lock, necessary spillways, power plants and appertaining structures; a concrete arch bridge, bridge substructures and approaches; retaining walls, highways, and other incidental details, between Station 1046 + 16, the south end of Contract No. 25, at Dunham's Basin road, Washington county, and the Hudson river, at Fort Edward, Washington county, Station 1245. Station 1046 + 16 to Station 1245. Length, 3.76 miles	998,920 00	972,210 00	32,409 00
M. Fitzgerald	Aug. 8, 1906	Contract No. 34, Erie canal. For furnishing and erecting in place a steel highway bridge superstructure over the Erie canal at Saratoga avenue, Waterford	22,604 00	20,611 50	11,781 00

TABLE OF CONTRACTS PENDING ON THE EASTERN DIVISION, SEPTEMBER 30, 1907— (Continued).

Improvement of Public Highways.

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
The Orange Co. Road Construction Co.	July 20, 1906	Chester-Vail's Gate road, No. 154-A, Orange county	$25,509 00	$25,833 00	$23,766 36
The Orange Co. Road Construction Co.	July 20, 1906	Woodbury Central Valley road, No. 157, Orange county	24,330 00	18,367 80	17,933 02
The Orange Co. Road Construction Co	June 18, 1904	Newburg Shawangunk road, No. 161, Orange county	54,120 00	48,250 00	67,298 70
Corliss Construction Co.	July 9, 1906	Brunswick Turnpike road, No. 227, Rensselaer county	30,700 00	25,900 00	22,515 30
John E. Consalus	June 29, 1906	Saugerties Kingston road, No. 228, Ulster county	55,700 00	40,800 00	52,110 90
Stewart-Kerbaugh Shanley Co	Oct. 1, 1906	Kingston-High Falls road, No. 229, Ulster county	82,300 00	57,000 00	....
Joseph Walker	July 11, 1906	Kingston-Ellenville (section 1) road, No. 230, Ulster county	88,200 00	63,439 00	12,053 41
McNamee & Rice	July 7, 1906	Post (section 1) road, No. 231, Ulster county	71,100 00	52,250 00	44,201 85
The Clinton Beckwith Engineering & Contracting Co.	July 9, 1906	Frankfort East Schuyler road, No. 233, Herkimer county	14,300 00	12,700 00	12,563 35
Morris Kantrowitz	Aug. 30, 1906	Delhi Middletown road, No. 239, Delaware county	53,300 00	46,775 00	34,613 50
John W. Flynn	July 3, 1906	Cohoes Waterford road, No. 240, Saratoga county	24,432 41	21,138 40	19,323 29
Schenectady Cont. Co	July 13, 1906	Saratoga-Ballston road, No. 241, Saratoga county	40,370 00	30,669 00	14,107 54
Saratoga Trap Rock Co	July 13, 1906	Saratoga-Glens Falls (section 2) road, No. 242, Saratoga Co.	9,820 00	8,513 40	8,300 06
The Clinton Beckwith Engineering & Contracting Co.	July 9, 1906	Mechanicville-Stillwater road, No. 243, Saratoga county	21,300 00	18,000 00	4,884 00
The Clinton Beckwith Engineering & Contracting Co.	July 9, 1906	Saratoga-Schuylerville road, No. 244, Saratoga county	59,550 00	55,000 00	30,295 00
Robert Shafer	July 12, 1906	Gloversville-Meco-Phelps road, No. 246, Fulton county	21,000 00	17,203 07	15,998 85
The Clinton Beckwith Engineering & Contracting Co.	July 9, 1906	Johnstown-Keck's Center (section 2) road, No. 247, Fulton county	47,100 00	40,000 00	22,000 00
Schenectady Cont. Co.	Sept. 1, 1906	Gloversville-Broadalbin road, No. 248, Fulton county	22,300 00	16,243 00	4,060 75
The Clinton Beckwith Engineering & Contracting Co.	July 9, 1906	Plattsburg-Keeseville (section 3) road, No. 258, Clinton Co.	56,700 00	36,000 00	36,946 05
The Buckley Construction Co.	July 6, 1906	Plattsburg-Mooers (section 2) road, No. 259, Clinton county	75,170 00	55,894 00	55,309 15
The Buckley Construction Co.	Aug. 1, 1906	Plattsburg-Mooers (section 3) road, No. 260, Clinton county	43,660 00	33,000 00	14,520 00

The Scofield Co	July 6, 1906	Peekskill-Salem Center (section 1) road, No. 261, Westchester county	50,150 00	43,233 00	7,394 61
The Scofield Co	July 6, 1906	Peekskill-Salem Center (section 2) road, No. 262, Westchester county	41,250 00	33,711 00	31,688 34
Robert Shafer	July 12, 1906	Lake Pleasant-Speculator road, No. 277, Hamilton county	33,900 00	24,443 40	3,345 71
De Graff & Hogeboom	Aug. 30, 1906	Greenville-Slate Hill road, No. 282, Orange county	65,900 00	56,865 00	22,828 28
The Orange County Road Construction Co	Sept. 4, 1906	Greenville-Port Jervis road, No. 283, Orange county	72,000 00	57,350 00	22,366 50
Martin Murray	July 2, 1906	Averill Park-Crooked Lake road, No. 284, Rensselaer county	37,440 00	27,660 00	21,305 70
Thomas H. Karr	July 7, 1906	Nassau-Brainard road, No. 285, Rensselaer county	34,900 00	31,500 00	27,720 00
Morris Kantrowitz	Aug. 30, 1906	Rensselaer-Best Road, No. 287, Rensselaer county	43,750 00	35,349 00	28,632 69
E. M. & W. Ferguson	Sept. 3, 1907	Crescent Avenue road, No. 289, Suffolk county	23,200 00	16,896 10	....
The Clinton Beckwith Engineering & Contracting Co	July 9, 1906	Amsterdam-Hagaman road, No. 298, Montgomery county	19,400 00	15,000 00	1,502 90
Joseph Walker	July 11, 1906	Saulwater's Corners-Young's Corners road, No. 299, Montgomery county	29,100 00	27,000 00	24,933 50
Stewart-Kerbaugh-Shanley Co	Sept. 3, 1907	Fonda-Tribes Hill road, No. 303, Montgomery county	20,900 00	18,705 95	....
Stewart-Kerbaugh-Shanley Co	Sept. 3, 1907	Sprakers-Rural Grove road, No. 304, Montgomery county	59,600 00	55,809 45	....
Town of Rochester	July 3, 1906	Kingston-Ellenville (section 2) road, No. 305, Ulster county	71,725 00	56,500 00	26,320 00
Stewart-Kerbaugh-Shanley Co	Sept. 3, 1907	Kingston-Ulster Landing road, No. 306, Ulster county	58,100 00	51,927 30	....
Joseph Walker	Sept. 3, 1907	Plattekill-Modena road, No. 307, Ulster county	73,100 00	58,579 00	....
The Orange County Road Construction Co	Sept. 4, 1906	Middletown-Cuddebackville (section 1) road, No. 312, Orange county	42,100 00	36,400 00	19,656 00
Stewart-Kerbaugh-Shanley Co	Sept. 3, 1907	Middletown-Cuddebackville (section 2) road, No. 313, Orange county	56,950 00	51,072 20	....
S. B. VanWagonen	June 30, 1906	Gilbertsville-Mt. Upton road, No. 314, Otsego county	46,900 00	37,000 00	17,390 00
The Clinton Beckwith Engineering and Contracting Co	July 9, 1906	Morris-Gilbertsville (section 1) road, No. 315, Otsego county	32,700 00	26,000 00	20,699 25
Siver & Gould	July 10, 1906	Shady Side-Otego road, No. 317, Otsego county	26,200 00	19,967 75	15,098 74
S. B. VanWagonen	June 30, 1906	Schenevus-Maryland road, No. 319, Otsego county	41,300 00	34,400 00	33,655 20
Bellew & Merritt	July 20, 1906	Peekskill-Salem Center (section 3) road, No. 331, Westchester county	47,800 00	42,000 00	12,797 20
Bellew & Merritt	July 20, 1906	Peekskill-Salem Center (section 4) road, No. 332 Westchester county	39,650 00	34,690 00	16,651 20
Buckley Construction Co	July 6, 1906	Saratoga-Corinth road, No. 340, Saratoga county	63,500 00	51,000 00	30,303 45
John W. Polcaro	July 6, 1906	Stockport-Hudson road, No. 341, Columbia county	30,150 00	23,100 00	15,939 00
John W. Polcaro	Aug. 28, 1906	Chatham-Chatham Center road, No. 342, Columbia county	8,700 00	7,500 00	3,900 00
Charles R. Lewis	July 10, 1906	Frankfort-Utica (section 2) road, No. 359, Herkimer county	18,700 00	14,600 00	9,845 60
Ulysses G. Stockwell	July 9, 1906	Johnstown-Tribes Hill (section 1) road, No. 361, Fulton county	24,000 00	20,149 00	18,738 57

TABLE OF CONTRACTS PENDING ON THE EASTERN DIVISION, SEPTEMBER 30, 1907 — (*Concluded*).

Improvement of Public Highways — (*Continued*).

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Alonzo Schaupp	Sept. 3, 1907	Northville–Chapman's Corners road, No. 362, Fulton county	$16,900 00	$15,346 70	....
Stewart - Kerbaugh - Shanley Co.	Sept. 3, 1907	Mayfield–Northville (section 1) road, No. 363, Fulton county	12,000 00	10,408 40	....
Robert Shafer	July 12, 1906	Preston Hollow Potter Hollow road, No. 364, Albany county	27,400 00	24,036 50	$10,335 69
Stewart - Kerbaugh - Shanley Co.	Sept. 3, 1907	Gloversville–Bull Run road, No. 376, Fulton county	25,400 00	23,582 40	....
Robertson & Gerehart Construction Co.	Sept. 3, 1907	Albany–Schenectady (section 2) road, No. 385, Albany county	63,500 00	50,790 01	....
Stewart - Kerbaugh - Shanley Co.	Sept. 4, 1907	Kitchawan–Croton Lake road, No. 405, Westchester county	17,125 00	14,787 65	....
Malloy & Davis	Sept. 4, 1907	Troy Schenectady (section 2) road, No. 407, Schenectady county	37,400 00	34,225 77	....
Casey & Murray	July 10, 1906	Glens Falls–Lake George road, No. 417, Warren county	84,700 00	72,500 00	56,581 50
Casey & Murray	July 10, 1906	Lake George Bolton Landing road, No. 418, Warren county	108,875 00	82,500 00	56,660 90
Lawlor & Haines	Aug. 31, 1906	Rhinebeck Hyde Park road, No. 432, Dutchess county	37,725 00	31,998 00	17,598 90
Buckley Construction Co.	Sept. 1, 1906	Chazy Chazy Landing–Ober's Corners road, No. 433, Clinton county	38,925 00	33,987 00	1,019 61
Jeremiah T. Finch	Sept. 1, 1906	Jerico Turnpike–Plainview road, No. 436, Nassau county	80,950 00	56,000 00	73,025 00
Russell Contracting Co.	Sept. 4, 1907	Jerusalem Avenue–Front Street road, No. 437, Nassau county	81,000 00	70,357 02	....
Stewart - Kerbaugh - Shanley Co.	Sept. 4, 1907	East Nassau Brainard road, No. 439, Rensselaer county	42,000 00	37,950 49	....
The Clinton Beckwith Engineering, and Contracting Co.	Aug. 31, 1906	Saratoga–Glens Falls (sections 4 and 5) road, No. 441, Saratoga county	74,700 00	59,987 00	34,792 46
Morris Kantrowitz	Sept. 4, 1907	Saratoga–Gansevoort road, No. 442, Saratoga county	45,700 00	37,611 50	....
Stewart - Kerbaugh - Shanley Co.	Sept. 4, 1907	Saratoga–Greenfield–Schuylerville–Glens Falls road, No. 443, Saratoga county	60,300 00	55,194 96	....
McNamee & Rice	July 10, 1906	Poughkeepsie–Hyde Park road, No. 453, Dutchess county	52,450 00	38,000 00	....
Ulysses G. Stockwell	July 19, 1906	Little Falls–East Creek road, No. 456, Herkimer county	61,500 00	48,949 00	20,069 09
Sylvester A. Seymour	July 9, 1906	Little Falls–Herkimer road, No. 457, Herkimer county	65,700 00	55,950 00	27,493 50
J. H. Nelson & Co.	July 10, 1906	Herkimer–Frankfort road, No. 458, Herkimer county	38,925 00	31,367 00	14,145 88
The Clinton Beckwith Engineering and Contracting Co.	July 9, 1906	East Schuyler–Deerfield road, No. 459, Herkimer county	62,300 00	56,000 00	12,348 80

J. H. Nelson & Co.	July 10, 1906	Herkimer–Middleville road, No. 460, Herkimer county	72,515 00	62,325 93	10,595 41
The Clinton Beckwith Engineering and Contracting Co.	Aug. 31, 1906	Ausable Forks–Clintonville road, No. 476, Clinton county	56,150 00	44,649 00	25,003 44
Robertson & Gerehart Construction Co.	Sept. 4, 1907	Selkirk–Coeymans road, No. 508, Albany county	41,000 00	38,646 16	....
Stewart - Kerbaugh -Shanley Co.	Sept. 4, 1907	Mt. Kisco–Pleasantville road, No. 519, Westchester county.	42,270 00	39,653 20	....
Stewart - Kerbaugh -Shanley Co.	Sept. 4, 1907	Pleasantville–Pocantico Hills road, No. 520, Westchester county	36,250 00	31,822 80	....
Jeremiah T. Finch	Sept. 5, 1907	West Chazy–Chazy road, No. 533, Clinton county	56,250 00	52,305 45	....
General Construction Co.	July 7, 1906	Amenia–Wassaic road, No. 537, Dutchess county	45,500 00	39,960 00	29,570 40
John W. Polcaro	July 6, 1906	Chatham–Spencertown road, No. 540, Columbia county	23,500 00	19,200 00	14,863 73
Jeremiah T. Finch	Sept. 5, 1907	Syosset–Cold Spring Harbor road, No. 545, Nassau county.	36,850 00	33,678 16	....
James E. Martin	July 5, 1906	Poughkeepsie–Pleasant Valley road, No. 549, Dutchess county	60,450 00	52,496 00	32,818 05
Stewart - Kerbaugh -Shanley Co.	Sept. 5, 1907	Rhinebeck–Elizaville road, No. 552, Dutchess county	58,500 00	49,595 55	....
The Lane Construction Corporation	Sept. 5, 1907	Matteawan–Wicopee road, No. 567, Dutchess county	47,100 00	40,027 00	....
Joseph Walker	July 11, 1906	Baldwin Place–Mahopac road, No. 569, Putnam county	51,500 00	44,000 00	33,210 71
Stewart - Kerbaugh -Shanley Co.	Sept. 5, 1907	Carmel–Kent road, No. 570, Putnam county	55,650 00	51,925 50	....
Harry S. Williams	Sept. 1, 1906	Nevis–Blue Store road, No. 589, Columbia county	28,600 00	24,987 00	10,769 91
County of Rockland	Sept. 13, 1906	Highland Lake–Tompkins Cove road, No. 593, Rockland county	105,650 00	105,585 00	29,689 20
Hinman & Sproul	Sept. 5, 1907	New Lebanon–Brainard road, No. 615, Columbia county	62,800 00	53,188 15	....
Malloy & Davis	Sept. 5, 1907	Rotterdam Junction–Pattersonville road, No. 640, Schenectady county	34,000 00	28,717 50	....
Reardon & Byrne	Sept. 5, 1907	Sandy Hill–Glens Falls road, No. 656, Warren county	25,000 00	20,062 01	....

REPORT

OF THE

DIVISION ENGINEER

OF THE

MIDDLE DIVISION

For the Fiscal Year Ending September 30, 1907.

MIDDLE DIVISION.

STATE OF NEW YORK,
DEPARTMENT OF STATE ENGINEER AND SURVEYOR,
MIDDLE DIVISION.

SYRACUSE, N. Y., *October* 1, 1907.

Hon. FREDERICK SKENE, *State Engineer and Surveyor, Albany, N. Y.:*

Sir.— I have the honor to submit herewith my annual report as Division Engineer of the Middle Division of your Department for the fiscal year ending September 30, 1907.

The work of this division has very materially increased in the past year, both as to Barge canal work and highway improvement.

For canal purposes, the Middle Division comprises that portion of the Erie canal from the east line of Oneida county to the east line of Wayne county, the Black River canal, the Oswego canal and the Cayuga and Seneca canal in their entire lengths.

There has been very little engineering work connected with the existing canals on this division during the past year. We have assisted the Superintendent of Public Works whenever called upon, and are always ready to lend assistance and advice if desired.

A break occurred on the Erie canal at the culvert over Onondaga creek, on the Syracuse level, on July 30, 1907. The work of repairing this break was conducted by the Superintendent of Public Works, through his engineer, Mr. Ripley, and as this Department was not called upon to take charge of the engineering feature, I feel that a description of the repairs should not be included in this report. This structure should be entirely rebuilt at the close of navigation.

The Department has been called upon to make surveys, prepare plans and assist in giving testimony on behalf of the State in the Court of Claims in suits brought for damages. This work has principally been conducted under the direction of Leonard D. Brownell, Assistant Engineer.

For highway improvement, under chapter 115, Laws of 1898, and acts amendatory thereto, the Middle Division comprises the following counties: Broome, Cayuga, Cortland, Chenango, Jefferson, Lewis, Madison, Oneida, Onondaga, Oswego, Seneca, St. Lawrence, Tioga and Tompkins.

For Barge canal purposes, the division is the same as the canal divisions, with the exception that the western limit extends to the west line of the town of Savannah, Wayne county.

SENATE AND ASSEMBLY REPORTS.

During the year we have investigated and reported on the following bills: Senate Nos. 180, 181 and 477; Assembly Nos. 863 and 1367.

WORK UNDER SPECIAL APPROPRIATIONS.

The repairs to the Brasher Falls dam and the construction of a vertical retaining wall on the Oneida feeder have been completed, and there remain but two contracts pending, viz.: The North Salina street bridge and the stairways for the Catharine street bridge, both in the city of Syracuse.

The details of the contracts completed and in force are herewith appended.

CONTRACTS COMPLETED DURING FISCAL YEAR ENDING SEPTEMBER 30, 1907.

CONSTRUCTING A NEW APRON AND REPAIRING STATE DAM AT BRASHER FALLS.

(Chapter 729, Laws of 1904; chapter 700, Laws of 1905; chapters 230 and 686, Laws of 1906.)

Contractor, B. P. Clark.

Engineer in charge, David R. Lee.

Appropriation	$5,510 03
Engineer's estimate	5,038 25
Contract price	5,038 25
Final account	4,737 66

This contract was described in the 1906 report, at which time the work was practically completed. The apron timbers were broken and the foundation undermined by breaking up of ice in the St. Regis river in 1903, and for this reason new apron and repairs were necessary. The work was carried to completion under the direction of David R. Lee, Assistant Engineer.

CONSTRUCTING A VERTICAL RETAINING WALL ON THE WEST SIDE OF THE ONEIDA FEEDER, ONEIDA.

(Chapter 686, Laws of 1906.)

Contractor, H. W. Fisher.

Engineer in charge, David R. Lee.

Appropriation	$4,500 00
Engineer's estimate	4,124 76
Contract price	4,114 77
Final account	3,992 55

The work under this contract consisted of building a vertical retaining wall of third-class concrete along the west side of the Oneida feeder, between Cedar and Spring streets in the city of Oneida. This wall will prevent the banks of the feeder from washing, and also improve the appearance of this locality.

CONTRACTS PENDING SEPTEMBER 30, 1907.

CONSTRUCTING STAIRWAYS FOR THE LIFT BRIDGE AT CATHARINE STREET, SYRACUSE.

(Chapter 683, Laws of 1906.)

Contractor, National Construction Company.

Engineer's estimate	$1,065 50
Contract price	1,500 00
Payments to September 30, 1907	Nothing

When this bridge was constructed, no provision was made for stairways. These are now to be built to provide a crossing for foot passengers when the bridge is raised.

CONSTRUCTING A LIFT BRIDGE OVER THE OSWEGO CANAL AT NORTH SALINA STREET, SYRACUSE.

(Chapter 668, Laws of 1906.)

Contractor, John M. Schultz.

Engineer's estimate	$62,621 00
Contract price	65,686 00
Payments to September 30, 1907	Nothing

This contract consists of removing the existing superstructure, building a new substructure, furnishing and erecting a new superstructure for a lift bridge over the Oswego canal at North Salina street, Syracuse.

The contract was awarded to John M. Schultz in January, 1907, and work will commence about December 1 of this year.

BARGE CANAL CONTRACT NO. 4, ERIE CANAL..

(Chapter 147, Laws of 1903.)

Contractor, Empire Engineering Corporation.

Engineers in charge, F. J. Wagner and Edward J. Berry.

Engineer's estimate	$812,560 00
Contract price	726,815 00
Payments to September 30, 1907	148,572 00

This contract consists of the excavation of the canal and the protection of its banks, from Station 6715 to the end of the breakwater or pier in Oneida lake at Sylvan Beach, Station 6970; the construction of foundations and abutments for Burdick's bridge at Station 6773, Roberts' bridge, Station 6887, the N. Y. O. & W. R. R. bridge, Station 6901, and the Sylvan Beach bridge, Station 6939, together with their approaches; the construction of Drum creek entrance and other creek intersections; the construction of the crib and pile docking at Sylvan Beach, and the breakwater and guard pier in Oneida lake, and work incidental thereto. The total length of the contract is 4.83 miles.

This contract was awarded to Linden W. Bates, who assigned it to the Empire Engineering Corporation. Construction work was started in September, 1905, but for a year the work progressed slowly. However, during the past few months it has progressed much more rapidly and is now about 25 per cent completed.

BARGE CANAL CONTRACT NO. 5, ERIE CANAL.

(Chapter 147, Laws of 1903.)

Contractor, Empire Engineering Corporation.
Engineer in charge, G. W. Stickney.

Engineer's estimate	$421,252 50
Contract price	381,987 50
Payments to September 30, 1907	104,679 00

Contract No. 5 consists of the excavation of the canal and the protection of its banks, from Station 5074, near Mosquito Point bridge over the Seneca river, to Station 5373, east of the village of Savannah; the construction of Owasco creek entrance; the construction of abutments and piers for the bridges at Mosquito Point, Sibley's, and Fox Ridge highway crossing, and incidental work thereto. The length of this contract is 5.66 miles.

The contract was awarded to Linden W. Bates in April, 1905, but subsequently assigned to the Empire Engineering Corporation. The work proceeded very slowly for some time, but during the past few months it has progressed more satisfactorily.

The last Legislature passed a bill changing the line of canal west of Station 5202, taking a detour to the south, and for this reason no work has been done beyond this point. The contract is now about 30 per cent completed.

BARGE CANAL CONTRACT NO. 7 — BRIDGES ON SECTIONS 5 AND 7, ERIE CANAL.

(Chapter 147, Laws of 1903.)

Contractor, The Groton Bridge Co.

Engineer's estimate	$39,883 30
Contract price	38,125 80
Payments to September 30, 1907	Nothing

This contract consists of furnishing and erecting in place steel highway bridge superstructures on Contracts Nos. 2, 3, 4, 5 and 6, of which Contracts Nos. 4 and 5 are in the Middle Division. As far as this division is affected, the contract includes Burdick's and Roberts' highway bridges near Sylvan Beach, the bridge at Sylvan Beach and the bridge at Mosquito Point.

This contract was awarded to The Groton Bridge Co., in August, 1906, and the shop work is well under way, but the erection has not been commenced.

BARGE CANAL CONTRACT NO. 10, OSWEGO CANAL.

(Chapter 147, Laws of 1903.)

Contractors, Mosier and Summers.

Engineer in charge, Edwin Styring.

Engineer's estimate	$1,149,988 00
Contract price	1,126,718 00
Payments to September 30, 1907	64,107 00

Contract No. 10 consists of excavating the canal and protecting its sides, constructing locks Nos. 2 and 3, the dams, bulkheads and other incidental details between 0.35 of a mile above the Broadway bridge and 0.28 of a mile below the Oneida street bridge at Fulton. Length of contract, 1.2 miles.

This contract was awarded June 7, 1906. Work to date has progressed very slowly and only about 8 per cent of the contract is completed and practically nothing outside of the item of excavation. During the past months, indications are that the work will proceed more rapidly.

BARGE CANAL CONTRACT NO. 12, ERIE CANAL.

(Chapter 147, Laws of 1903.)

Contractor, Stewart-Kerbaugh-Shanley Co.

Engineer's estimate	$3,082,560 00
Contract price	3,391,716 00
Payments to September 30, 1907	Nothing

This contract includes the excavation of the canal and protection of its sides, construction of lock No. 23 and appertaining structures, abutments and bridge approaches, bridges and other incidental details between deep water in Oneida lake, at its western end, and Mosquito Point bridge over the Seneca river, or from Station 2720 to Station 5074. The length of this contract is 43.73 miles.

The contract was awarded to the Stewart-Kerbaugh-Shanley Co., in September, 1907, and it is expected that work will begin about January 1, 1908.

BARGE CANAL CONTRACT No. 35, OSWEGO CANAL.

(Chapter 147, Laws of 1903.)

Contractor, Gilmour-Horton-Allen Co.

Engineer's estimate	$752,760 00
Contract price	739,261 00
Payments to September 30, 1907	Nothing

Contract No. 35 includes excavating the canal and protecting its sides, constructing locks Nos. 7 and 8, bulkheads, culverts, spillways and incidental details between 0.56 of a mile above Utica street bridge and the harbor line north of Bridge street bridge, Oswego. Length of contract, 0.85 of a mile.

This contract was awarded to Gilmour-Horton-Allen Co., in September, 1907, and the work thereon will begin about December 1, of this year.

BARGE CANAL.

(Chapter 147, Laws of 1903.)

For Barge canal work, the Middle Division is divided into the following residencies: Erie canal, Nos. 5, 6 and 7; Oswego canal, No. 1, and Water-Supply residency.

Erie canal residency No. 5, extending from the east line to the west line of Oneida county, with headquarters at Rome, was under the charge of Emile Low, Resident Engineer, to March 31, 1907, and from that date to the end of the fiscal year, under Fred J. Wagner, Acting Resident Engineer. The branch office of this residency is at Sylvan Beach and was under the direction of Fred J. Wagner, Assistant Engineer, to March 31, 1907, at which time Edward J. Berry was placed in charge.

Erie canal residency No. 6 extends from the west line of Oneida county to the west line of the village of Baldwinsville, and Erie residency No. 7 extends from the west line of the village of Baldwinsville to the west line of the town of Savannah. Residencies Nos. 6 and 7 have been combined for the present under Guy Moulton, Resident Engineer, with residency office at Syracuse and branch office at Fox Ridge, with G. W. Stickney, Assistant Engineer, in charge. Branch offices will probably be established at Brewerton and Baldwinsville during the coming year.

Oswego canal residency No. 1 extends from Three River Point to Lake Ontario at Oswego. The residency office is located at Fulton and was under the charge of B. E. Failing, Resident Engineer, to March 1, 1907, H. W. DeGraff, Resident Engineer, from March 1 to April 1, and D. D. Waldo, Resident Engineer, from April 1 to the end of the fiscal year. This residency will soon be divided and a residency office established at Oswego.

The Water-Supply residency is under the direction of Russell R. Stuart, Engineer of Water-Supply, with office at Syracuse and branch office at Rome.

The Barge canal work in the Middle Division is now progressing rapidly and during the past year a large number of surveys were made, including contracts Nos. 35 and 37, Oswego canal, contracts Nos. 30, 42, 43 and 44, Erie canal, and survey for the new route, commonly called "South of Savannah route," changes for which were authorized by the last Legislature. Borings were taken over a large portion of contracts Nos. 35 and 37, Oswego canal, also contracts Nos. 43 and 44, Erie canal, on what is known as "South of Rome route."

Two contracts have been awarded during the past year, namely, contract No. 35, Oswego canal, at Oswego, and contract No. 12, extending from deep water in Oneida lake to Mosquito Point, canalizing the Oneida and Seneca rivers.

Work on existing contracts is proceeding somewhat more satisfactorily than during the early part of the year. Contract No. 10, at Fulton, has consisted principally of excavation. The excavation for lock No. 2 was commenced in November, 1906, and continued until the following April, when work was stopped to prepare the canal for the opening of navigation, the lock site being within the present canal. In restoring the canal for navigation, a large amount of work was necessary as the bottom and sides of the old canal had been removed. It was necessary to sheet the sides with timber and plank and puddle in the rear. All the work incidental to placing the canal in condition for navigation was done at the contractor's expense, except that he was paid for the sheeting used. After navigation opened, the banks showed considerable leakage and were rebuilt where settlements occurred. The banks west of the Broadway street bridge pier were heavily loaded with stone from the excavation.

On contract No. 4, at Sylvan Beach, about three miles of nearly completed canal have been excavated by hydraulic dredge. The plans for this work called for excavation on a one on two slope, but it developed that the natural slope of the material was about one on four, necessitating radical changes in the contract, and the prism will have to be widened to allow for the increased slope.

Contract No. 5, at Mosquito Point, has also consisted principally of excavation and about 2½ miles of completed prism, excavated to grade, is finished.

The reports of the Resident Engineers on the several residencies follow:

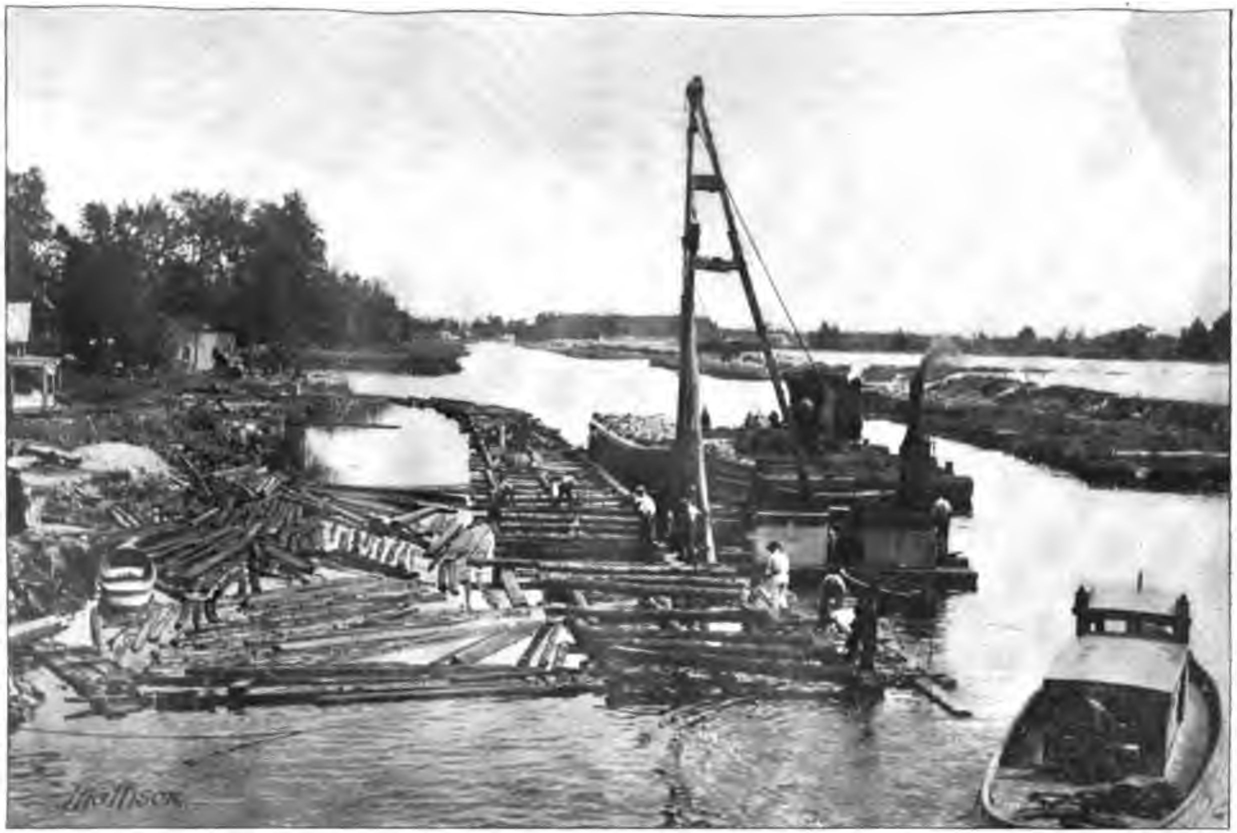
ERIE CANAL, RESIDENCY No. 5.

Acting Resident Engineer Fred J. Wagner reports:

"This residency contains what is known as the Rome summit level of the Barge canal and the conditions are such that a large amount of data and study is required in order to get the most feasible and cheapest route. The greater part of the work accomplished during the past year has been in locating lines and making estimates for Contracts Nos. 30, 42, 43 and 44. Contract No. 30 covers certain distances on both residencies Nos. 4 and 5, but that portion on residency No. 5 extends from the Oneida–Herkimer county line to the Black River division of the N. Y. C. R. R. Contract No. 42 extends from the westerly end of Contract No. 30 to a point about one-half mile east of the Oriskany road. Contract No. 43, from the west end of Contract No. 42 to a point about four miles east of Rome, and Contract No. 44, from the end of No. 43 to a point west of Rome, near Fort Bull.

"The work of locating Contract No. 42 and getting out plans for the same was done during the early part of the year and these plans are ready for the action of the Canal Board.

"Surveys, borings, plans and estimates of cost for Contracts Nos. 43 and 44, along what is known as the 'north of Rome' route, were made and sent to Albany during the fall and winter of the fiscal year, but the State Engineer and the Special Deputy State Engineer, after visiting Rome and looking over the situation, decided that what is known as the southern route through Rome would be more feasible and much cheaper, and accordingly a new line was run and cross-sections taken from the west end of Contract No. 42, at Oriskany, to Fort Bull, said line crossing the N. Y. C. R. R. tracks east of the Rome Locomotive Works, also crossing the Mohawk river near Mill street in Rome. However, after studying the conditions from data obtained, a revision of this line was found necessary and another line has been run from the west end of Contract No. 42, farther to the south, crossing the Mohawk river just east of Oriskany and continuing on the south side of the river, crossing the N. Y. C. R. R. about four miles east of Rome and joining the former southern line at Rome. This line has been cross-sectioned, borings made, and the plans for Contracts Nos. 43 and 44 are ready to be sent to Albany. The above line was run and plans based on a water-surface level of 412 feet above tide. A preliminary line has also been run and a profile made for studying a line based on a water-surface elevation of 420 feet above tide, following the northern foothills of the Mohawk valley from the west end of Contract No. 42 to a point about 4 miles east of Rome, then crossing the N. Y. C. R. R. about one mile east of the Rome Locomotive Works and the Mohawk river near Mill street in Rome, then again crossing the railroad about one mile south of Rome and passing through the Rome swamp in a direct line to New London, thence on the south side of Wood creek to the east end of Contract No. 4. This route is now being studied by the State Engineer and Advisory Board of Consulting Engineers.



Barge Canal, Contract No. 4.
View near the entrance to the east end of Oneida lake, showing progress in placing of crib docking on the north side of the channel.

"That portion of Contract No. 30 lying within this residency has also been revised on the ground, and cross-sections taken, said revision following north of the Mohawk river, from the Oneida–Herkimer county line to the east end of the river straightening channel, thence to the Black River R. R. on the east end of Contract No. 42, along the line located in 1905. On the above lines, two crossings of the present Erie canal, numerous highway and railroad crossings, river crossings and river channel changes, stream entrances, dam and guard-lock near Oriskany, have been surveyed, borings taken, data plotted and sent to Albany.

"Concrete monuments have been placed at all transit points on the present south of Rome route, and in fact monuments have been placed over the entire line between the Oneida–Herkimer county line and the east end of Contract No. 4.

"*Contract No.* 4. On Contract No. 4, the progress of work has been slow during the greater part of the past year but at present is proceeding more rapidly. The nature of the material has caused some necessary changes to be made in the original plans, and the Canal Board is about to take up such changes as are recommended by the State Engineer. The excavation for the prism has mainly been done by hydraulic dredges, and a little over three miles of canal have been excavated to within an average of 2 feet above grade. The crib docking at the entrance to Oneida lake is well under way. The abutments for the Sylvan Beach highway bridge have been built, and the work on the concrete approaches is well started. The original plans call for a timber revetment on either side of the prism, and this work was carried on up to December 1, 1906, but since that time no work of this nature has been done, as the plans will undoubtedly be changed and a flatter slope given to the sides of the prism.

"The work of raising the N. Y. O. & W. R. R. bridge over Fish creek, also tracks approaching said bridge, was done by the railroad company under an agreement with the Canal Board, consequently the Empire Engineering Corporation was relieved of this work, which was included in the original contract. The railroad company practically completed this work last December.

"The following table shows the per cent of work done on this contract during the year as well as the total per cent of work done. These percentages were determined after deducting the work done by the railroad company, as above referred to:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing	Lump sum	....	9-10	....	90
Grubbing, cu. yds	7,800	....	2,421	....	31
All excavation, cu. yds	2,260,000	699,842	844,588	31	37
Forming embankment, cu. yds	66,381	....	6,121	....	9
Yellow pine, ft. B. M.	355,000	20,405	20,406	6	6
White oak, ft. B. M.	10,000	1,055	1,055	11	11
Round timber, lin. ft.	565,000	57,322	57,322	10	10
Square sawed hemlock, ft. B. M.	531,800	41,341	83,707	8	16
Foundation piles, 12 ft. long, No.	5,500	377	1,908	7	34
Foundation piles, 20 ft. long, No.	174	134	174	77	100
Foundation piles, 25 ft. long, No.	118	62	104	53	88
Foundation piles, 35 ft. long, No.	42	14	56	33	133
Sheet-piling, ft. B. M.	1,005,000	124,451	354,352	12	35
Steel and iron fastenings, lbs.	55,700	4,487	13,483	7	24
Second-class concrete, cu. yds	9,438	380	742	4	8
Stone filling, cu. yds.	49,610	2,208	2,208	4	4
Second-class riprap, cu. yds.	402	77	77	19	19
First-class concrete, cu. yds.	1,250	133	299	11	24
Steel reinforcement, lbs.	129,400	1,551	22,051	1	17
Labor, forms and second-class concrete	Lump sum	29 p r cent	56 per cent	29	56
Maintaining traffic, Sylvan Beach bridge	Lump sum	71 per cent	88½ per cent	71	88½

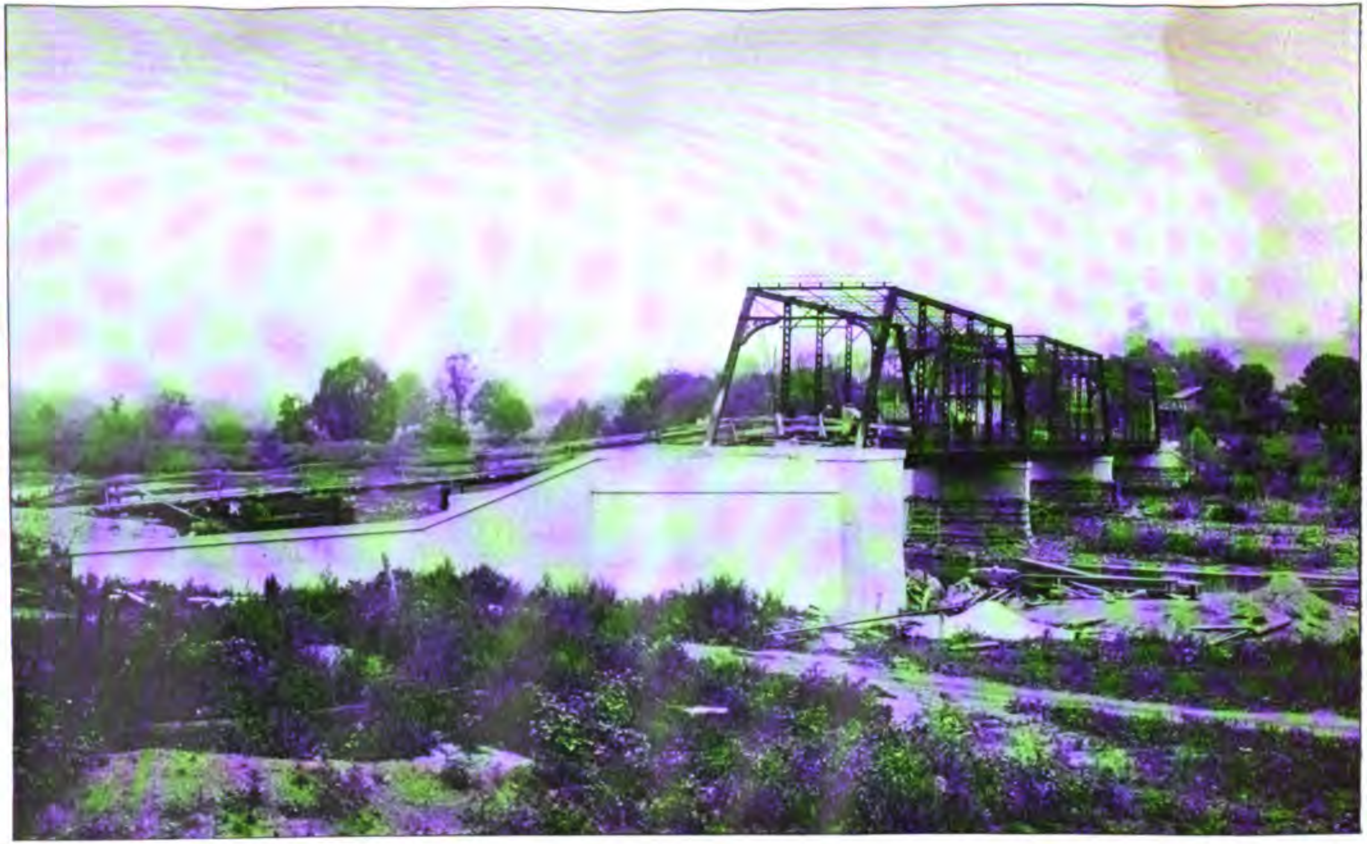
Total of all work done during year = 18 per cent of estimated cost.
Total of all work done to date = 24 per cent of estimated cost."

ERIE CANAL, RESIDENCY NO. 6.

Resident Engineer Guy Moulton reports:

"Residency No. 6 extends from deep water in Oneida lake to Baldwinsville, a distance, by the Barge canal line, of 23.4 miles. To maintain Oneida lake at the proper elevation, a dam in the Oneida river will be necessary, and will be located at Caughdenoy. The necessary surveys, cross-sections and drill tests have been made for obtaining the right of way and making the preliminary plans and estimate for this dam.

"Through the village of Baldwinsville, surveys, searches of titles, maps and tracings with descriptions have been made of 40 parcels of property for right-of-way purposes. A survey has been made of the south end of Onondaga lake, and extended across the salt lands to Syracuse, for the purpose of locating a harbor for the city. A study of the proposed harbor has been made, but no plans have been prepared as yet.



BARGE CANAL, CONTRACT No. 5.

View of Mosquito Point bridge, showing completed abutments and piers of the river bridge, with the superstructure in place, also the north abutment for the canal bridge.

"ERIE CANAL, RESIDENCY NO. 7.

"Residency No. 7 extends from Baldwinsville to the Wayne county line, a distance of 32.7 miles by the Barge canal line. During the year a revision of the canal location at the western end of this residency has been made. The revised line diverges from the original at station 5202+, at Campbell's island, and goes south of Crusoe island instead of across it, through the village of Savannah. It has been located in the field from the point of divergence to the Wayne county line, a distance of 9.5 miles. Test borings, to determine the character of the material to be excavated, have been made over 6.1 miles of this line, aggregating 4,162 linear feet of borings. Detailed surveys and maps of three railway crossings have also been made.

"*Contract No.* 5 is located on this residency, and extends from Station 5074, at Mosquito Point, to Station 5373, near Savannah. Owing to the revision of the canal location west of Station 5202+, no work has been done west of that point. Between there and Mosquito Point about two miles of the prism have been completed.

"The river bridge at Mosquito Point has been raised, and the abutments and retaining walls for the new canal bridge completed. At Howland island the south pier and abutment for the new canal bridge have also been built.

"The following table will show in detail the amount of the different classes of work done on this contract during the year:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing.............................acres.	175	....	152	....	87
All excavation,......................cu. yds.	2,560,000	800,029	844,191	31	33
Forming embankment,...............cu. yds.	29,000	1,908	4,040	6.6	14
Sawed hemlock......................ft. B. M.	210,000	56,457	56,457	27	27
Foundation piles, 12 ft. long,.............No.	1,000	....	31	....	3.1
Foundation piles, 25 ft. long.,............No.	200	....	5	....	2.5
Second-class concrete,................cu yds	3,100	967	1,472	31	47.5
First-class masonry coping, ...cu. yds	10	6	6	60	60
Stone filling in cribs,.................cu. yds	1,300	363	363	27.9	27.9

Total of all work done during year = 27 per cent of estimated cost.
Total of all work done to date = 30 per cent of estimated cost."

OSWEGO CANAL, RESIDENCY NO. 1.

Resident Engineer D. D. Waldo reports:

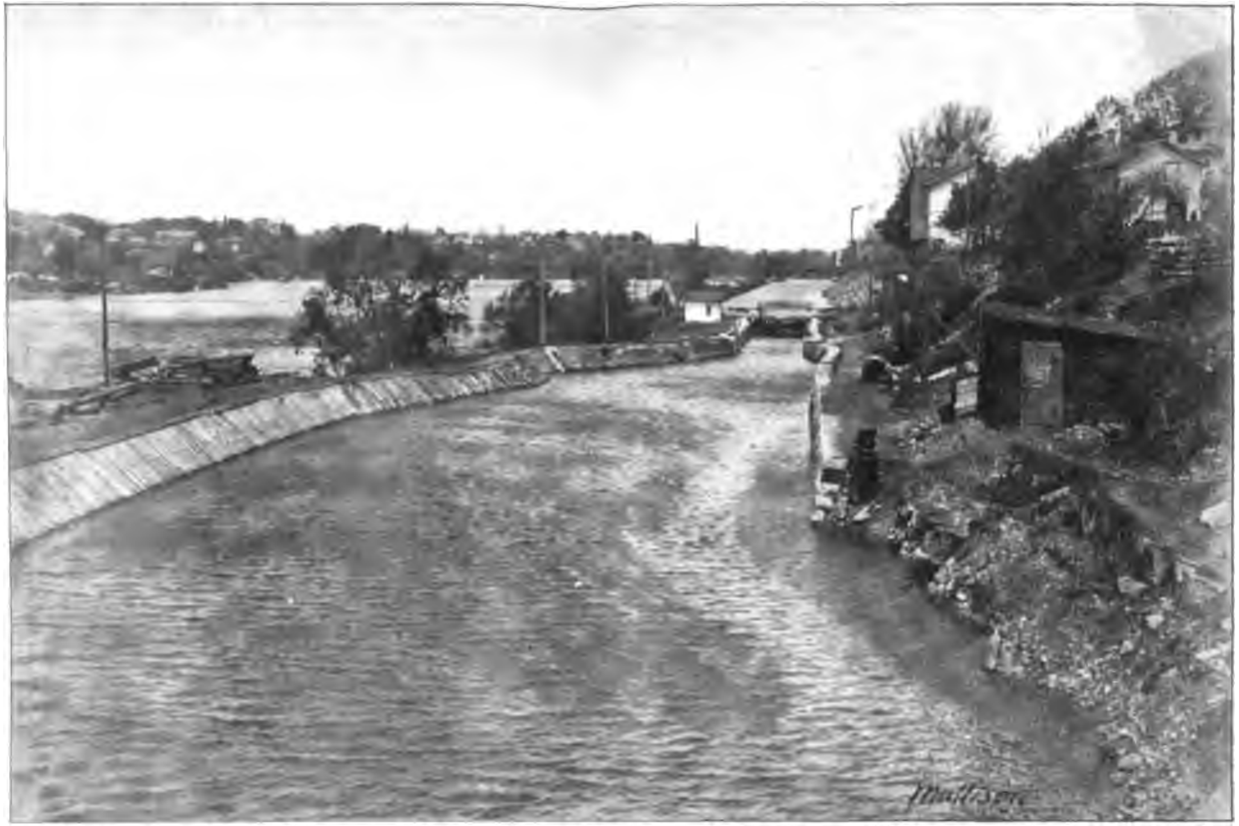
"Since April a stadia party has been running out the large area above the upper dam at Fulton that will be overflowed on account of the raise in that dam. This area is a strip on each side of the Oswego river all the way to Phœnix, nine miles away, and in addition, a large territory along Ox creek, extending from the river five or six miles inland. This survey lacks about two weeks' work of completion. A large amount of notes has accumulated and are practically untouched in the office. It will probably take all winter to reduce the notes, adjust the circuit and plot the survey. Short stadia surveys have also been run at Minetto, High Dam and Oswego, to extend the topography beyond the former surveys.

"Surveys for appropriation maps have been made at Fulton, Minetto and Oswego. At Fulton a large amount of land was required for spoiling areas, and this, together with that required for the location of the canal, has made these surveys extensive. At Oswego, Contract No. 35, the surveys are half completed and at Minetto, Contract No. 37, the surveys were preliminary and represent about a month's work.

"Cross-sections and soundings have been taken, from time to time, as changes in location of line and plan and the extending of former sections have called for them. This work has been done at various places along the line of the river from Phœnix to Oswego.

"Borings have been taken at Phœnix for lock No. 1, at Minetto for the new dam and for the lock walls and structures on Contract No. 37, and at Oswego for the new location of High Dam. The residency has been well covered with borings and it is unlikely that more work of this nature will be required.

"This residency has one contract under way, No. 10, through Fulton. The work has been in progress for about a year, but as yet little more than the item of excavation has been touched. Excavation for lock No. 2 started last fall and continued until spring, when navigation opened and the work was stopped. About one-half of the excavation for the lock has been completed. The main work of the contractors has been the excavation of earth



BARGE CANAL, CONTRACT NO. 10.

View looking north from the upper bridge at Fulton, showing the present Oswego canal as prepared for the resumption of navigation after the winter's work of excavating for the Barge canal.

and rock at the north end of the contract, where the canal and the raceways from the mills come together.

"The following table shows the amount of work done up to the end of the fiscal year:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
All excavation,....................cu. yds.	485,000	78,600	78,600	16	16
Sheeting and bracing,...............ft. B. M.	50,000	57,500	57,500	115	115
Second-class concrete,...............cu. yds.	88,800	252	252	0.3	0.3

Total of all work done during year = 6.4 per cent of estimated cost.
Total of all work done to date = 6.4 per cent of estimated cost.
NOTE.—The estimated cost of the contract is based on the contractor's prices and Alteration No. 1 is included, making the total estimated cost of contract $1,106,718.00."

BUREAU OF WATER-SUPPLY.

The report of Russell R. Stuart, Engineer of Water-Supply, is as follows:

"The work under the direction of this bureau has been confined to the water-supply of the Rome summit level of the Barge canal. The greater part of this work is in the Middle Division. About three-fourths of the Hinckley dam and reservoir, however, is within the limits of the Eastern Division.

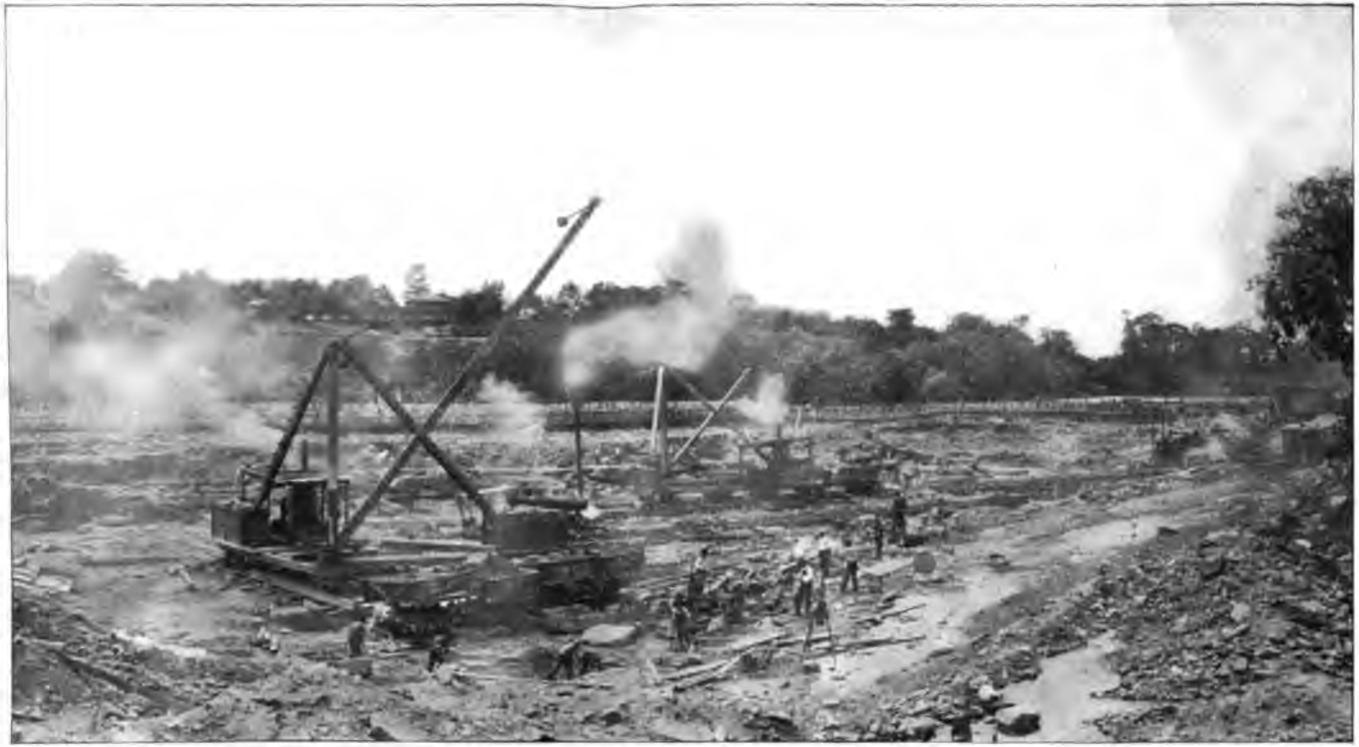
"The following is a general outline of the work proposed: A dam and reservoir at Delta, a dam and reservoir at Hinckley, a diverting dam at Trenton Falls, and a feeder from there emptying into Nine Mile creek, a dam and reservoir on Nine Mile creek about two miles below Stittville, and a dam and reservoir on Limestone creek at High Bridge. These will be taken up in order, with a statement of work done during the fiscal year.

"*Delta Reservoir, Contract No.* 55. This reservoir will have an area of about 4.3 square miles and a capacity of about 2,750,000,000 cubic feet. The dam, as proposed, will be about 108 feet high above the lowest foundation, and about 1,016 feet long, out to out. It will have a spillway 300 feet long near its center, and will be provided with four 60-inch pipes passing through it, with suitable gates and valves to regulate the discharge. This contract includes the relocation of the Black River canal around the outside of the reservoir and the relocation of five highways on account of the existing highways being submerged. The total length of the new canal will be about 1.8 miles, and in place of the seven existing locks there will be four new ones, three combined and one single. The level below lock No. 14, at Westernville, will be continued to the head of the flight of combined locks in the vicinity of the dam site, and the Mohawk river will be crossed by an aqueduct about 205 feet long. On the highway relocations, one new bridge will be built over the canal and two existing bridges will be moved to new abutments. The total length of the proposed highway changes is about 4.5 miles.

"Early in the year, alternate plans and comparative estimates were made of work in the vicinity of the dam and submitted to the Advisory Board. After further consideration, however, some of the main features and many of the details were changed and new plans have been made to conform to these modifications. These contract plans are now nearing completion. Pencil plans of the locks were made in this office and sent to Albany, where they are being finished. Plans for the remaining structures are being finished in this bureau.

"A new line was run for the relocation of the Black River canal and it is now about two-thirds cross-sectioned. A preliminary survey and estimate were made to determine the advisability of raising the level of the canal below lock No. 14, in order to avoid the heavy rock cut on the proposed new line. The estimate showed that this scheme was inadvisable on account of cost and it was abandoned. Surveys for the highway relocations, which were in progress at the beginning of the year, have been practically completed. Appropriation surveys and maps have been made of the land in the vicinity of the dam. Numerous borings and soundings to determine the elevation and character of the rock were also made in this vicinity.

"*Hinckley Reservoir, Contract No.* 50. This reservoir will have an area of about 4.5 square miles and a capacity of about 3,400,000,000 cubic feet. This does not include that portion above Grant, which has not yet been surveyed. However, as the water will be shallow over this portion, it will not add greatly to



BARGE CANAL, CONTRACT No. 10.
View at Fulton, showing progress in excavating at the site of lock No. 2.

the available supply. During the year the reservoir was mapped on a scale of 1 inch to 200 feet, except that portion in the vicinity of the dam site, on which the scale is 1 inch to 100 feet. A new line for the proposed dam was run and cross-sectioned and three Calyx drill borings were made with a total depth in rock of 49 feet. In connection with the new proposed line, 81 wash drill borings were made with a total depth bored of 1,036 feet. Profiles of the proposed lines have been made and a rock contour map of the dam site made from the elevations of the rock as determined by the borings.

"*West Canada Creek Feeder and Diverting Dam, Contract No.* 51. The proposed feeder will be about seven miles long before it empties into Nine Mile creek and a portion of this distance will be along a branch of the creek. The feeder was surveyed and mapped on a scale of 1 inch to 500 feet previous to this year, and during this year it has been mapped on a scale of 1 inch to 100 feet. No structures on this contract have been designed.

"*Nine Mile Creek Dam and Reservoir, Contract No.* 52. No work has been done on this contract during the year. According to the preliminary estimate by Mr. E. Kuichling, the reservoir will have an area of about 1.85 square miles and a capacity of about 476,000,000 cubic feet.

"*High Bridge Dam and Reservoir, Contract No.* 58. The proposed reservoir will have an area of about 0.8 square mile and a capacity of about 620,000,000 cubic feet, assuming the crest of the dam to be at elevation 538.0. This reservoir has been surveyed and mapped, and the area and capacity computed previous to this year, but no work has been done during this fiscal year.

"In general, the designing of structures and the preparation of contract plans have been done at the Syracuse office, and the mapping and miscellaneous office work at Rome. The field work has also been directed from the Rome office. All of the work, however, has been under the direction of the Engineer of Water-Supply. Glenn D. Holmes was Engineer of Water-Supply until March 18, 1907, and the writer from April 5 until the end of the fiscal year."

IMPROVEMENT OF PUBLIC HIGHWAYS.

(Chapter 115, Laws of 1898, and acts amendatory thereto.)

The volume of work on the improvement of public highways has increased with rapid strides during the past two years in the various counties of this division. From 1898 to 1905, inclusive, there had been 44 contracts awarded in this division, providing for the improvement of 95 miles of highway, distributed in but seven of the fourteen counties. After the approval by the people of the concurrent resolution of the Legislature of 1905, providing for the sale of bonds by the State to the extent of $50,000,000 for the improvement of the highways, the work progressed more rapidly and during the past two years 87 contracts have been awarded, providing for the improvement of 275 miles of highway, distributed in twelve of the fourteen counties, leaving but two counties, namely, Lewis and Tioga, which have not as yet taken advantage of this act.

During the past year approximately 90 miles of macadam road-surface have been laid on 45 separate contracts, in ten counties. The work of grading and rebuilding of structures has been progressed on 11 other contracts, making a total of 56 contracts upon which work has been done during the year. Almost as much macadam surface has been laid during the past year as was laid in the seven years from 1899 to 1905, inclusive. In addition to the 11 contracts where only grading and structural work has been done, there are five contracts upon which no work has been done, all of which were awarded in 1906, the time set for completion being October 15, 1907. This condition is due to awarding to contractors more work than they have plant or capital to carry to completion within the time specified.

The $50,000,000 bond issue, being equitably distributed among the counties of the State, will give, on a basis of cost of $7,000 per mile, about 2,028 miles of roads which may be improved in this division, of which contracts have been awarded for 275 miles, and plans for 255 miles have been approved by the supervisors and are now awaiting contract; in addition, there are 555 miles which have been surveyed and are in various stages of mapping, leaving a balance of 943 miles upon which no work has been done.

All roads which have been improved in this division, under chapter 115, Laws of 1898, have been provided with a macadam surface, generally six inches in thickness and varying from 10 to 16 feet in width. One contract has been prepared and is soon to be advertised, providing for a gravel surface, also one contract for a gravel foundation course with three inches of macadam surface.

Very little first-class rock for highway improvement is found native in this division. The Onondaga limestone outcrop extends east and west across the division from Geneva on the west, via Waterloo, Auburn, Mottville, Jamesville, Chittenango Falls and Blakeslee to Oriskany Falls on the east. This outcrop does not exceed three miles in extent, north and south. There is also a thin layer, about 20 feet in thickness, known as the Tully limestone, which outcrops in a rambling line, following the contours north and south in the valleys of the Cayuga, Owasco and Skaneateles lakes, extending around the south end of the latter two, but disappearing under Cayuga lake a few miles north of Ithaca. We have located the ledge at Union Springs, Moravia, Niles, Borodino, Otisco. Tully, Truxton, Otselic and Smyrna. South of this ledge there is no stone suitable for macadam surface, the outcrop being a soft Devonian sandstone, running to shale. Extending north from Trenton, through the Black River valley, is found the Trenton limestone which spreads out over a large portion of Jefferson county. East of the Black River valley is found the Adirondack gneiss, with some syenite and granite, and along the St. Lawrence river is the Beekmantown limestone.

The harder grades of limestone will furnish a very satisfactory macadam surface for medium to light travel, say up to 80 vehicles per day. With travel over this amount, the surface soon wears away into dust in the summer and mud in the spring and fall. On the Chenango river road in Broome county, with an Onondaga limestone surface and a daily traffic of about 120 vehicles, the wear on the macadam was one-half inch in depth per year, the surface remaining smooth and true at all times, with very little dust or mud.

Trap-rock from the Palisades along the Hudson river and from New Jersey on the south, has been used to some extent for macadam surface course. The Hudson river trap-rock was used on two roads in Onondaga county that were improved in 1899. Both have about an equal traffic, 160 vehicles of all kinds in nine hours, and the total wear on the surface for 8 years ranges from 1 to 1½ inches in depth for the center 8 feet of the macadam to but ½ inch on the edges of a 15-foot width. In about 2 years' time the surface of the macadam becomes rough by reason of the cushion or binder washing and blowing away; this cushion has been renewed about every 2 years, by spreading a layer of limestone screenings, or ¾-inch stone, about ¾ inch deep over the center 8 feet of the macadam. This soon grinds up and simply smoothes the surface for a time.

We have been forced to use the soft sandstone of the southern counties for macadam surface in some instances where the roads improved were several miles distant from the railroads, and where the cost of hauling imported trap-rock is prohibitive. On one road in Chenango county, improved with local stone, with a daily traffic of 85 vehicles of all kinds, the wear was one inch in depth per year, and in 2½ years had to be resurfaced. The top course of macadam on this road was formed of fragments ranging from ½ inch to 2 inches.

The results obtained on this division would indicate that the size of the stone forming the top course influences the wear to a considerable extent, and that the size used should vary with the texture of the rock and with the amount of traffic. For traffic of 100 vehicles, or less, per 10 hours, if the macadam is formed of soft sandstone, the top course should be of fragments ranging from 1½ inches to 2½ inches; if formed of limestone, from 1 inch to 2 inches; if trap-rock is used, from ½ inch to 1½ inches. If the traffic is over 100 vehicles and less than 200 in 10 hours, the top course should be formed of trap-rock, granite or syenite, ranging from 1 inch to 2 inches in size. If traffic is over 200 vehicles and less than 500 in 10 hours, the top course should be constructed of trap-rock, ranging from 1½ inches to 2½ inches. If traffic is over 500 vehicles in 10 hours, macadam is not suitable for road-surface.

Trap-rock can be obtained on the lines of the Delaware, Lackawanna and Western, Erie, Delaware and Hudson, and Lehigh Valley railroads, costing from $2 to $2.25 per ton. A hard grade of syenite may now be obtained from Little Falls, N. Y., on the lines of the New York Central and West Shore railroads, for from $1.30 to $2 per ton. Where the traffic exceeds 50 vehicles in 10 hours and the average haul is not over 4 miles from the railroad, it would seem advisable to use the harder grades of stone in preference to limestone or other local stone.

Where the surface is formed of fine stone, the general wear is greater and the surface is more easily rutted. Where coarse stone is used, the surface soon becomes rough and requires dressing over with a thin layer of fine, loose stone, about once every two years. This does not require the use of a roller, as is necessary when the top course is worn out, and seems preferable to constructing a surface that will wear smooth at all times, but which will necessitate a resurfacing with a new top course in 3 or 4 years. A continuous smooth macadam surface indicates considerable wear, that of ½ inch in depth or more per year, under the ordinary conditions of a country highway.

Macadam is simply a consolidated mass of crushed stone, the larger voids filled with stone chips and the smaller voids filled and the whole cemented together with a mortar formed of the powdered stone and water. This mortar must not only be made, but it must be ground, or tempered, while in a wet state, until a sticky gum is formed, which will not readily dissolve in water and which cements the fragments of stone together. In just the right condition of moisture, this gum pastes down over the surface and, to some extent protects the macadam from the wheels. In dry weather, this cushion is powdered into dust, and the wheels of traffic are directly on the individual stones of the surface. This same condition prevails in protracted wet weather, the cushion becoming soft mud, and the wheels hunt out and grind off the edges and surfaces of the individual stones.

Experiments are being made with a preparation of tar to fill the voids between the fragments of stone forming the surface of the macadam, thereby bridging the space with an impervious substance that will carry the load from one fragment to the next and which will prevent the calks of the horses' shoes and the knife blade wagon wheels from breaking off and grinding up the edges of the individual fragments, as is done with ordinary macadam, both in protracted dry and wet weather, with the anticipated result of reducing the wear on the surface and consequently reducing the amount of dust and mud. While these results are expected, the small amount of macadam thus far treated and the recent date of its application require that comment on its practicability should be reserved until further observation can be made.

Inspection of the highways that have been improved during the past years, would indicate that while a depth of 6 inches of macadam is sufficient under ordinary conditions, there are portions of many roads that require an additional thickness, and it is necessary, therefore, to locate the material forming the subgrade which breaks up and becomes unstable as the frost is leaving the ground, and to reinforce such locations with a sub-base of rough stone or gravel. Very little regular Telford foundation has been used on this division, the field or quarry stone being roughly handled, placing the larger stone in the bottom and using generally a rolled thickness of 9 inches to one foot. This is thoroughly consolidated with a steam-roller and the macadam placed directly on this foundation. In other instances, a layer of gravel, 6 to 9 inches in depth, has been placed under the macadam as a sub-base course. Where either of these methods has been used to reinforce the macadam, no trouble has since been experienced by the macadam breaking up in the spring. It is somewhat difficult to locate this unstable material in the summer season, when the work is being progressed, and it is now the practice, whenever possible, before the road is improved, to make an inspection as the frost is leaving the ground in the spring and to note the sections that break up.

The worst material encountered in this territory is a fine silt sand, commonly termed quicksand, which, however, forms a stable foundation all the year, except for about three weeks in the spring. This material apparently cannot be made stable by drainage, as several breaks have occurred on embankments four feet in height. The only remedy is to thicken the crust sufficiently to carry the load over the unstable foundation. Soft clay is also a dangerous material for a foundation. Hard red clay, while it will heave with the frost and raise the macadam often as much as 9 inches, still has sufficient stability in itself, when the frost leaves the ground, to support the traffic with no more serious results than leaving a rutted surface; this is also true of water-bearing gravel.

In conclusion, a comment on the destructiveness of the motor car to a macadam surface seems warranted. After a heavy motor car, with rubber tires, has passed over a macadam road at high speed, the wheel tracks may be followed readily by the eye, as the tires have sucked out the fine material from the surface for a width of 4 to 6 inches, leaving the sharp edges of the larger fragments exposed to the next iron tired vehicle, which breaks off the sharp edges and smoothes up the surface by crowding the chips broken off into the voids. The next motor car throws out the fine particles, again leaving the roughened surface, which is again ground off by the iron tires, and thus the rapid deterioration progresses.

The details of contracts completed during the past fiscal year, also of the contracts in force, are given in the progress tables which are herewith appended.

CONTRACTS COMPLETED DURING THE YEAR ENDING SEPTEMBER 30, 1907.

ENDICOTT ROAD, NO. 174, BROOME COUNTY.

Length, 2.17 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $22,500.

Contract dated, June 16, 1904.

Work commenced, June, 1905.

Work completed, October 1, 1906.

Final account, $20,638.20.

Contractor, County of Broome.

Engineer in charge, R. J. Marcher.

This road is an extension of the Lestershire road, No. 125, with which it connects the villages of Lestershire and Union. The macadam is 6 inches in thickness, 4 inches of local stone and 2 inches of trap-rock.

ADDITIONAL WORK ON STATE ROAD, NO. 185, JEFFERSON COUNTY.

Engineer's preliminary estimate, $1,266.

Contract dated, August 1, 1906.

Work commenced, September, 1906.

Work completed, December 18, 1906.

Final account, $1,215.

Contractor, J. Francis Ward.

Engineer in charge, D. C. Wedgeworth.

This road was improved with macadam formed of crushed granite boulders which did not bind satisfactorily, and this additional work consisted in spreading over the surface a layer of limestone, which was left for the traffic to consolidate.

CENTER VILLAGE ROAD, No. 211, BROOME COUNTY.

Length, 0.57 mile.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $5,000.

Contract dated, June 16, 1904.

Work commenced, August, 1906.

Work completed, September 10, 1907.

Final account, $4,486.84.

Contractor, County of Broome.

Engineer in charge, R. J. Marcher.

This road is the main street of the unincorporated village of Center Village. Macadam surface is 6 inches in thickness, 4 inches of local stone and 2 inches of limestone.

OUAQUAGA ROAD, No. 212, BROOME COUNTY.

Length, 1.01 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $9,350.

Contract dated, June 16, 1904.

Work commenced, May, 1906.

Work completed, September 10, 1907.

Final account, $8,007.92.

Contractor, County of Broome.

Engineers in charge, R. J. Marcher and S. J. Stewart.

This road is a continuation of the Windsor road, No. 213, with which we now have a macadam road from Windsor to Ouaquaga. The macadam is 6 inches in thickness, 4 inches of local stone and 2 inches of limestone.

RIVER ROAD, WINDSOR (SECTION 2) ROAD, NO. 213, BROOME COUNTY.

Length, 2.83 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $25,900.

Contract dated, June 16, 1904.

Work commenced, July, 1904.

Work completed, November 20, 1906.

Final account, $28,221.39.

Contractor, County of Broome.

Engineers in charge, N. E. Young and C. J. Myers.

This road extends from the village line of Windsor northerly along the Susquehanna River valley, connecting with Ouaquaga road, No. 212. The macadam is 6 inches in thickness, 4 inches of local stone and 2 inches of limestone.

RIVER ROAD, WINDSOR (SECTION 1) ROAD, NO. 214, BROOME COUNTY.

Length, 1.87 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $16,450.

Contract dated, June 16, 1904.

Work commenced, June, 1905.

Work completed, November 20, 1906.

Final account, $14,023.44.

Contractor, County of Broome.

Engineers in charge, R. J. Marcher and C. J. Myers.

This road extends from the village line of Windsor southerly down the Susquehanna River valley. The macadam is composed of 4 inches of local stone and 2 inches of limestone.

GUILFORD ROAD, NO. 225, CHENANGO COUNTY.

Length, 5.75 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $50,000.

Contract dated, July 13, 1904.

Work commenced, August, 1904.

Work completed, November 20, 1906.

Final account, $42,604.72.

Contractor, Douglas V. Ashley.

Engineers in charge, W. G. Wildes and Harry H. Greene.

This contract provides for the improvement of the streets through the unincorporated villages of Rockwell's Mills, Mt. Upton, Rockdale and Guilford, all in the town of Guilford. Plans have been approved for the road connecting the Mt. Upton and Rockdale sections, which will provide a continuous length of macadam road for a distance of about 7 miles up the Unadilla valley from Rockdale. The macadam is 6 inches in thickness, 4 inches of local stone and 2 inches of limestone.

SACKETTS HARBOR ROAD, NO. 237, JEFFERSON COUNTY.

Length, 1.45 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $12,700.

Contract dated, July 9, 1906.

Work commenced, July, 1906.

Work completed, August 12, 1907.

Final account, $11,212.62.

Contractors, Brennan and O'Brien.

Engineers in charge, D. C. Wedgeworth and F. S. Strong.

This contract provides for the improvement of the first section of the Watertown-Sacketts Harbor road, extending from Watertown city line to the town line of Hounsfield. Thickness of macadam is 6 inches, all local limestone.

BRIDGE ROAD, NO. 268, BROOME COUNTY.

Length, 1 mile.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $10,150.

Contract dated, July 12, 1906.

Work commenced, July, 1906.

Work completed, September 23, 1907.

Final account, $9,724.43.

Contractor, County of Broome.

Engineers in charge, R. J. Marcher and S. J. Stewart.

This is a cross road from one side of the Chenango River valley to the other, connecting the Fenton road with the Town Line Extension road and completing with macadam a favorite drive out of Binghamton, up one side of the river, across and down the other, a distance of about 10 miles from the ends of the city pavement. The macadam is constructed of 4 inches of local stone and 2 inches of trap-rock.

MOHAWK RIVER ROAD, DEERFIELD, NO. 297, ONEIDA COUNTY.

Length, 3.74 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $36,850.

Contract dated, July 10, 1906.

Work commenced, July, 1906.

Work completed, August 14, 1907.

Final account, $38,199.17.

Contractors, Casey and Murray.

Engineer in charge, C. J. Myers.

This road extends westerly from Deerfield Corners, just north of Utica, along the river road and, with the completion of roads Nos. 295, 296 and 560, which are now under contract, will provide an improved highway from Deerfield Corners to Rome, a distance of about 14 miles. The macadam is composed of 4 inches of limestone and 3 inches of syenite.

MINETTO ROAD, NO. 370, OSWEGO COUNTY.

Length, 0.48 mile.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $6,750.

Contract dated, September 18, 1906.

Work commenced, April 13, 1907.

Work completed, August 10, 1907.

Final account, $6,054.48.

Contractor, The Barnett Contracting Company.

Engineer in charge, Harry H. Greene.

This improvement extends from Minetto station, on the Delaware, Lackawanna and Western Railroad to the River road in the village of Minetto. The macadam surface is 7 inches in thickness, 4 inches of local stone and 3 inches of syenite.

CINCINNATUS ROAD, NO. 377, CORTLAND COUNTY.

Length, 0.42 mile.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $4,000.

Contract dated, July 10, 1906.

Work commenced, July 20, 1906.

Work completed, May 28, 1907.

Final account, $3,614.41.

Contractor, Charles H. Quereau.

Engineer in charge, N. E. Young.

This road is the main street through the unincorporated village of Cincinnatus. The macadam surface is six inches in thickness, all local limestone.

WATERTOWN–CARTHAGE (SECTION 2) ROAD, NO. 427, JEFFERSON COUNTY.

Length, 5.47 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $42,200.

Contract dated, July 7, 1906.

Work commenced, July 25, 1906.

Work completed, September 12, 1907.

Final account, $38,018.85.

Contractor, Celestin C. Burns.

Engineer in charge, Frederick S. Strong.

This road extends from the village line of Black river through Felts Mills to the river bridge at De Feriet. The macadam is composed of local limestone 6 inches in thickness.

JORDAN VALLEY (SECTION 1) ROAD, NO. 430, ONONDAGA COUNTY.

Length, 1.72 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $15,200.

Contract dated, July 20, 1906.

Work commenced, July 23, 1906.

Work completed, May 22, 1907.

Final account, $13,916.37.

Contractor, J. Charles Dayton.

Engineer in charge, George D. Williams.

This road extends from the Skaneateles Junction Railroad station to the Elbridge village line. The macadam is composed of limestone 6 inches in thickness.

CORTLAND-GROTON (SECTION 1) ROAD, NO. 446, CORTLAND COUNTY.

Length, 1.35 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $11,100.

Contract dated, July 10, 1906.

Work commenced, September 19, 1906.

Work completed, September 30, 1907.

Final account, $9,634.68.

Contractor, Douglas V. Ashley.

Engineers in charge, N. E. Young and C. J. Myers.

This road extends westerly from the city line of Cortland toward Groton. The macadam is 6 inches in thickness and is composed of 4 inches of local stone and 2 inches of limestone.

REPAIR CONTRACT NO. 4, ROAD NO. 147, JEFFERSON COUNTY.

Engineer's preliminary estimate, $2,000.

Contract dated, August 1, 1906.

Work commenced, September, 1906.

Work completed, November 1, 1906.

Final account, $2,502.05.

Contractor, J. Francis Ward.

Engineer in charge, D. C. Wedgeworth.

About three-quarters of a mile of this road is subjected to the extremely heavy traffic of hauling sand and gravel from pits along the road to Watertown. The repair contract consisted in laying a new top course of macadam on this section of the road.

CONTRACTS PENDING SEPTEMBER 30, 1907.

CORTLAND–HOMER ROAD, NO. 208, CORTLAND COUNTY.

Length, 0.54 mile.

Width of macadam, 16 and 20 feet.

Engineer's preliminary estimate of total cost, including engineering, $8,600.

Contract dated, December 31, 1906.

Work commenced, July 10, 1907.

Work completed, 8 per cent.

Contractor, John Weber & Sons, Inc.

Engineer in charge, C. J. Myers.

This short section of highway extends from the corporation line of Cortland to the corporation line of Homer. Active work on this contract has just been started.

ADAMS–HENDERSON (SECTION 2) ROAD, NO. 234, JEFFERSON COUNTY.

Length, 6.89 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $49,950.

Contract dated, July 7, 1906.

Work commenced, May 2, 1907.

Work completed, 49 per cent.

Contractor, Celestin C. Burns.

Engineer in charge, Frederick S. Strong.

This road is a continuation of road No. 181, which was improved in 1904, and when completed it will provide a macadam road from Adams to Henderson Harbor and complete the loop of improved highway from Adams to Watertown, via Henderson Harbor and Sacketts Harbor, a distance of about 25 miles. The macadam is composed of limestone 6 inches in thickness.

WATERTOWN–SACKETTS HARBOR–HENDERSON (SECTION 2) ROAD, NO. 235, JEFFERSON COUNTY.

Length, 2.23 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $15,180.

Contract dated, July 7, 1906.

Work commenced, July 24, 1906.

Work completed, 97 per cent.

Contractor, Celestin C. Burns.

Engineers in charge, D. C. Wedgeworth and Frederick S. Strong.

This contract provides for the improvement of the last section of the stage road between Watertown and Sacketts Harbor. The macadam is 6 inches in thickness, all local limestone.

REDWOOD–ALEXANDRIA BAY (SECTION 2) ROAD, NO. 236, JEFFERSON COUNTY.

Length, 4.19 miles.

Width of macadam, 12, 16 and 20 feet.

Engineer's preliminary estimate of total cost, including engineering, $38,200.

Contract dated, September 20, 1907.

Contractor, Stewart-Kerbaugh-Shanley Company.

No work has been done under this contract.

HENDERSON HARBOR ROAD, NO. 238, JEFFERSON COUNTY.

Length, 5.09 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $30,450.

Contract dated, July 7, 1906.

Work commenced, April 15, 1907.

Work completed, 63 per cent.

Contractor, Celestin C. Burns.

Engineer in charge, Frederick S. Strong.

The highway to be improved extends along the shore of Lake Ontario from Henderson Harbor to the end of road No. 181. The macadam is 6 inches in thickness and is composed of local limestone. The macadam is reinforced with 6 inches of stone subbase for about one-half the length of the road.

COLEMAN HILL (SECTION 1) ROAD, NO. 245, ONONDAGA COUNTY.

Length, 1.21 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $15,600.

Contract dated, September 20, 1907.

Contractor, Stewart-Kerbaugh-Shanley Company.

No work has been done under this contract.

UTICA–ONEIDA CASTLE (SECTION 1) ROAD, NO. 250, ONEIDA COUNTY.

Length, 8.53 miles.

Width of macadam, 16 feet; width of asphalt, 23 feet.

Engineer's preliminary estimate of total cost, including engineering, $144,100.

Contract dated, July 10, 1906.

Work commenced, August, 1906.

Work completed, 91 per cent.

Contractors, Casey and Murray.

Engineer in charge, George R. Winslow.

This contract includes the improvement of the road from Utica to New Hartford, 1.22 miles, with asphalt, the abutters and Electric R. R. Company paying difference in cost between macadam and asphalt. The macadam section is 6 inches in thickness — from New Hartford to Kirkland, 3 inches of local stone and 3 inches of syenite, and from Kirkland to Lairdsville, 6 inches local stone.

DEPOSIT ROAD, No. 265, BROOME COUNTY.

Length, 2.78 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $30,000.

Contract dated, July 12, 1906.

Work commenced, July, 1906.

Work completed, 71 per cent.

Contractor, County of Broome.

Engineers in charge, Guy L. Noble and E. H. Stewart.

This road extends westerly from Deposit toward Ouaquaga. The macadam is 6 inches in thickness and is composed of 3 inches of local stone and 3 inches of trap-rock.

TUNNEL ROAD, No. 266, BROOME COUNTY.

Length, 1.70 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $13,750.

Contract dated, July 12, 1906.

Work commenced, May 28, 1907.

Work completed, 35 per cent.

Contractor, County of Broome.

Engineers in charge, S. J. Stewart and George C. Mills.

This contract covers the improvement of the roads through the village of Sanitaria Springs. The work has been delayed by reason of the contractor taking more work than his plant could carry on.

CASTLE CREEK ROAD, NO. 267, BROOME COUNTY.

Length, 6 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $54,750.

Contract dated, July 12, 1906.

Work commenced, July, 1906.

Work completed, 86 per cent.

Contractor, County of Broome.

Engineers in charge, R. J. Marcher and S. O. Steere.

This road joins road No. 126, and when completed will provide an improved highway from Binghamton to Castle Creek, a distance of 10 miles. The macadam is 8 inches in thickness, all local stone.

UTICA-ONEIDA CASTLE (SECTION 2) ROAD, NO. 271, ONEIDA COUNTY.

Length, 8.53 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $86,500.

Contract dated, September 15, 1906.

Work commenced, May 1, 1907.

Work completed, 12 per cent.

Contractors, Casey and Murray.

Engineer in charge, George R. Winslow.

This road, together with road No. 250, will provide an improved highway across Oneida county from Utica to Oneida Castle, a distance of about 17 miles. The macadam is 6 inches in thickness — from Lairdsville to Vernon, all local stone, and from Vernon to Oneida Castle, 3 inches of local stone and 3 inches of syenite.

GULF BRIDGE (SECTION 1) ROAD, NO. 274, BROOME COUNTY.

Length, 1.75 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $15,250.

Contract dated, July 12, 1906.

Work commenced, April 24, 1907.

Work completed, 92 per cent.

Contractor, County of Broome.

Engineer in charge, T. D. Ringwood.

This road extends southerly from Chenango Forks toward Binghamton and is constructed of macadam 6 inches in thickness, 3 inches of local stone and 3 inches of trap-rock.

UNION–MAINE ROAD, NO. 275, BROOME COUNTY.

Length, 3.04 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $31,500.

Contract dated, July 12, 1906.

Work commenced, July 16, 1907.

Work completed, 22 per cent.

Contractor, County of Broome.

Engineer in charge, E. H. Stewart.

This contract provides for the improvement of a section of the highway from Union to Maine. The work has been delayed by reason of the contractor having insufficient plant with which to progress all contracts taken.

SYRACUSE–WATERTOWN ROAD, NO. 278, OSWEGO COUNTY.

Length, 2.41 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $26,950.

Contract dated, September 20, 1907.

Contractor, Stewart–Kerbaugh–Shanley Company.

No work has been done under this contract.

WEST OSWEGO RIVER ROAD, NO. 279, OSWEGO COUNTY.

Length, 2.48 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $27,800.

Contract dated, September 20, 1907.

Contractor, Stewart–Kerbaugh–Shanley Company.

No work has been done under this contract.

OSWEGO–STERLING ROAD, NO. 280, OSWEGO COUNTY.

Length, 1.66 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $13,550.

Contract dated, September 18, 1906.

Work commenced, May 27, 1907.

Work completed, 86 per cent.

Contractor, The Barnett Contracting Company.

Engineer in charge, Harry H. Greene.

This contract provides for the improvement of a section of the Oswego–Sterling road, from Oswego city limits to Fruit Valley. The macadam is 6 inches in thickness and is constructed of 4½ inches of local stone and 1½ inches of trap-rock.

SOUTH SALINA STREET ROAD, NO. 290, ONONDAGA COUNTY.

Length, 1.06 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $13,900.

Contract dated, August 31, 1906.

Work commenced, May 6, 1907.

Work completed, 78 per cent.

Contractor, Wm. J. Dwyer.

Engineer in charge, L. D. Brownell.

This road is a continuation of South Salina street, Syracuse, and extends southerly from East Onondaga toward the Indian Reservation. The bottom course of macadam is composed of 5 inches of limestone and the top, 3 inches of syenite.

WEST LAKE (SECTION 2) ROAD, NO. 292, ONONDAGA COUNTY.

Length, 1 mile.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $10,550.

Contract dated, July 10, 1906.

Work not started.

Contractor, Charles H. Quereau.

No work has been done under this contract by reason of the contractor having insufficient plant and finances with which to carry to completion the several contracts awarded to him.

EAST LAKE (SECTION 2) ROAD, NO. 293, ONONDAGA COUNTY.

Length, 1 mile.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $9,500.

Contract dated, July 10, 1906.

Work commenced, September, 1906.

Work completed, 38 per cent.

Contractor, Charles H. Quereau.

Engineer in charge, George D. Williams.

Work was started on this contract in September, 1906, and then abandoned for reasons stated under road No. 292.

MOHAWK RIVER ROAD, FLOYD, NO. 295, ONEIDA COUNTY.

Length, 2.80 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $29,750.

Contract dated, July 10, 1906.

Work commenced, November 1, 1906.

Work completed, 65 per cent.

Contractors, Casey and Murray.

Engineers in charge, C. J. Myers and George W. Bradley.

This contract provides for the improvement of a section of the river road from Deerfield Corners to Rome. The macadam is 7 inches in thickness, 4 inches of local stone and 3 inches of syenite.

MOHAWK RIVER ROAD, MARCY, NO. 296, ONEIDA COUNTY.

Length, 4.54 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $49,200.

Contract dated, July 10, 1906.

Work commenced, August, 1906.

Work completed, 90 per cent.

Contractors, Casey and Murray.

Engineers in charge, C. J. Myers and George W. Bradley.

This road extends from the easterly end of road No. 295, to the westerly end of road No. 297, which was completed during the past summer. The top course of macadam is constructed of 3 inches of syenite and the bottom course of 4 inches of local stone.

RESERVATION ROAD, FAYETTE, NO. 320, SENECA COUNTY.

Length, 5.72 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $50,500.

Contract dated, September 18, 1907.

Contractor, H. C. Schroeder.

No work has been done under this contract.

VALLEY ROAD, MARCELLUS, NO. 328, ONONDAGA COUNTY.

Length, 1.31 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $19,500.

Contract dated, August 31, 1906.

Work commenced, August 28, 1907.

Work completed, 5 per cent.

Contractor, Wm. J. Dwyer.

Engineer in charge, R. V. Collins.

This contract provides for the improvement of a section of the valley road from Marcellus to Camillus. Work delayed by reason of contractor taking more contracts than he was willing to equip with plants.

VALLEY ROAD, CAMILLUS, NO. 329, ONONDAGA COUNTY.

Length, 2.32 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $34,400.

Contract dated, November 23, 1906.

Work commenced, April 10, 1907.

Work completed, 51 per cent.

Contractor, Charles H. Quereau.

Engineer in charge, R. V. Collins.

This road connects with road No. 328, which together extend from Camillus to Marcellus. The macadam is 6 inches in thickness, all local limestone.

SKANEATELES–HAMILTON TURNPIKE (SECTION 1) ROAD, NO. 330, ONONDAGA COUNTY.

Length, 2.44 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $28,500.

Contract dated, September 20, 1907.

Contractor, Stewart-Kerbaugh-Shanley Company.

No work has been done under this contract.

CAYUGA HEIGHTS ROAD, NO. 336, TOMPKINS COUNTY.

Length, 3.17 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $37,400.

Contract dated, August 30, 1906.

Work commenced, October 15, 1906.

Work completed, 14 per cent.

Contractor, County of Tompkins.

Engineers in charge, S. J. Stewart and William H. Snyder.

This contract provides for opening and improving a new road through the Cayuga Heights Land Company's property, back of Cornell University, for the ultimate purpose of developing a new tract.

SYRACUSE TURNPIKE ROAD, No. 337, MADISON COUNTY.

Length, 1.58 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $13,800.

Contract dated, September 20, 1907.

Contractor, Stewart-Kerbaugh-Shanley Company.

No work has been done under this contract.

CATSKILL TURNPIKE (SECTION 2) ROAD, No. 338, TOMPKINS COUNTY.

Length, 1.38 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $14,900.

Contract dated, August 30, 1906.

Work commenced, October 2, 1906.

Work completed, 36 per cent.

Contractor, County of Tompkins.

Engineers in charge, S. J. Stewart and William H. Snyder.

This road is a continuation of road No. 72, extending from Ithaca toward Slaterville Springs. The macadam is 6 inches in thickness, 4 inches of local stone and 2 inches of limestone.

GEORGETOWN ROAD, No. 339, MADISON COUNTY.

Length, 3.29 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $31,400.

Contract dated, September 18, 1906.

Work commenced, June 3, 1907.

Work completed, 18 per cent.

Contractor, Wm. I. Tyler.

Engineer in charge, Thomas F. Nichols.

This road extends from Georgetown station to the village of Georgetown. Work was delayed as the contractor was unwilling to purchase sufficient plant to progress both of his contracts at the same time.

COLLAMER ROAD, NO. 348, ONONDAGA COUNTY.

Length, 1.90 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $20,400.

Contract dated, July 9, 1906.

Work commenced, July, 1906.

Work completed, 98 per cent.

Contractor, Wm. J. Dwyer.

Engineers in charge, William H. Snyder and George D. Williams.

This contract provides for the improvement of a section of the road between Syracuse and Collamer. The work was practically completed in 1906, but owing to the heavy traffic on the road, it was decided to increase the thickness of the macadam with a new top course of syenite, which will no doubt be laid early in 1908.

AUGUSTA ROAD, AUGUSTA SECTION, NO. 368, ONEIDA COUNTY.

Length, 3.38 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $36,000.

Contract dated, November 23, 1906.

Work commenced, September 9, 1907.

Work completed, 9 per cent.

Contractor, John H. Gordon.

Engineer in charge, George R. Winslow.

This contract provides for the improvement of a section of the highway from Oriskany Falls to Rome via Augusta and Vernon Center, which section extends from Augusta northerly toward Vernon Center. The macadam is 6 inches in thickness, all local limestone.

AUGUSTA ROAD, ORISKANY FALLS SECTION, NO. 369, ONEIDA COUNTY.

Length, 2.99 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $30,600.

Contract dated, August 29, 1906.

Work commenced, April 22, 1907.

Work completed, 91 per cent.

Contractor, John H. Gordon.

Engineer in charge, George R. Winslow.

This road is a continuation of road No. 368, and extends from Oriskany Falls to Augusta. The macadam is composed of 6 inches of local limestone.

MAINE ROAD, No. 374, BROOME COUNTY.

Length, 3.37 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $33,550.

Contract dated, July 12, 1906.

Work commenced, January, 1907.

Work completed, 4 per cent.

Contractor, County of Broome.

Engineer in charge, R. J. Marcher.

This road is a continuation of road No. 275. The only work done to date is the delivery of fieldstone for crushing for the bottom course of macadam. The delay in starting the improvement is due to the fact that the contractor was awarded more work than could be taken care of by the county plant.

BARKER ROAD, No. 275, BROOME COUNTY.

Length, 0.62 mile.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $6,550.

Contract dated, July 12, 1906.

Work commenced, July 1, 1907.

Work completed, 86 per cent.

Contractor, County of Broome.

Engineer in charge, T. D. Ringwood.

This road is the main street through the unincorporated village of Chenango Forks and connects with and is a continuation of the Gulf Bridge road, No. 274. The macadam is 6 inches in thickness, 3 inches of local stone and 3 inches of trap-rock.

McGRAWVILLE ROAD, NO. 278, CORTLAND COUNTY.

Length, 2.90 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $30,750.

Contract dated, July 10, 1906.

Work commenced, August 6, 1906.

Work completed, 92 per cent.

Contractor, John Weber & Sons, Inc.

Engineers in charge, N. E. Young and C. J. Myers.

This road connects the village of McGrawville with the city of Cortland. The macadam is 6 inches in thickness, 4 inches of local stone and 2 inches of limestone.

HARFORD ROAD, NO. 379, CORTLAND COUNTY.

Length, 0.91 mile.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $7,600.

Contract dated, September 19, 1906.

Contractor, John Weber & Sons, Inc.

No work has been done under this contract.

STATE ROAD, HOMER, NO. 380, CORTLAND COUNTY.

Length, 4.39 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $42,400.

Contract dated, November 14, 1906.

Work commenced, July 17, 1907.

Work completed, 23 per cent.

Contractors, Mott & Kemper.

Engineers in charge, N. E. Young and C. J. Myers.

This road extends from the village of Homer northwesterly toward Scott. The macadam is constructed of 4 inches of local stone and 2 inches of limestone.

STATE ROAD, SCOTT, NO. 381, CORTLAND COUNTY.

Length, 2.72 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $27,300.

Contract dated, September 20, 1907.

Contractor, Stewart-Kerbaugh-Shanley Company.

No work has been done under this contract.

OWASCO ROAD, NO. 383, CAYUGA COUNTY.

Length, 2.19 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $21,500.

Contract dated, July 10, 1906.

Work commenced, July 30, 1906.

Work completed, 94 per cent.

Contractors, Brayer Brothers.

Engineer in charge, E. C. Clark.

This road is a continuation of Owasco street from the city line of Auburn and is subjected to heavy travel. The macadam is 6 inches in thickness, all limestone.

It is now proposed to treat the surface of the macadam with an application of tarvia.

FLEMING ROAD, NO. 384, CAYUGA COUNTY.

Length, 3.17 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $31,960.

Contract dated, November 10, 1906.

Work commenced, June 17, 1907.

Work completed, 26 per cent.

Contractor, The Scofield Company.

Engineer in charge, O. M. Severson.

This highway extends from the bridge over the Owasco outlet southerly along the west side of Owasco lake. The work of improvement has just been closed on account of the contractor's financial difficulties, the company having been placed in the hands of a receiver.

AUGUSTA ROAD, VERNON CENTER SECTION, NO. 406, ONEIDA COUNTY.

Length, 3.88 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $38,900.

Contract dated, November 27, 1906.

Work commenced, April 22, 1907.

Work completed, 79 per cent.

Contractor, Allyn G. Bridge.

Engineer in charge, George W. Bradley.

This contract provides for the improvement of a section, in the vicinity of Vernon Center, of the road from Oriskany Falls to Rome. The macadam is constructed of local limestone 6 inches in thickness.

VESTAL ROAD, NO. 420, BROOME COUNTY.

Length, 3.69 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $35,600.

Contract dated, July 12, 1906.

Contractor, County of Broome.

No work has been done under this contract.

WATERTOWN-THERESA (SECTION 3) ROAD, NO. 423, JEFFERSON COUNTY.

Length, 4.19 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $40,350.

Contract dated, September 20, 1907.

Contractor, Stewart-Kerbaugh-Shanley Company.

No work has been done under this contract.

BELLEVILLE–ADAMS (SECTION 1) ROAD, NO. 424, JEFFERSON COUNTY.

Length, 1.60 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $11,900.

Contract dated, November 16, 1906.

Work commenced, April 15, 1907.

Work completed, 97 per cent.

Contractor, Frederick Williams.

Engineer in charge, Frederick S. Strong.

This road is a spur from the Adams–Henderson road, extending to Belleville village. The macadam is 6 inches in thickness, all local limestone.

ADAMS–WATERTOWN (SECTION 2) ROAD, NO. 425, JEFFERSON COUNTY.

Length, 3.16 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $26,100.

Contract dated, July 3, 1906.

Work commenced, April 15, 1907.

Work completed, 47 per cent.

Contractor, Wm. J. Semper.

Engineer in charge, J. N. Slater.

This road extends from Adams Center toward Watertown. The macadam is 6 inches in thickness, all local limestone.

THOMPSON ROAD, NO. 429, ONONDAGA COUNTY.

Length, 2.83 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $25,700.

Contract dated, July 9, 1906.

Work commenced, April 3, 1907.

Work completed, 81 per cent.

Contractor, Wm. J. Dwyer.

Engineers in charge, William H. Snyder and N. E. Young.

The highway under improvement extends from Massina Springs to Orville. The macadam is constructed of limestone 6 inches in thickness.

SKANEATELES–SPAFFORD ROAD, No. 431, ONONDAGA COUNTY.

Length, 2.50 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $27,700.

Contract dated, July 20, 1906.

Work commenced, November 8, 1906.

Work completed, 38 per cent.

Contractor, J. Charles Dayton.

Engineers in charge, J. Otis Burt and F. F. Miller.

This road is a continuation of road No. 292 on the east side of Skaneateles lake, extending toward Spafford. The macadam is 6 inches in thickness, 4 inches local stone and 2 inches of limestone.

AUGUSTA ROAD, LOWELL AND SPENCER SECTIONS, No. 438, ONEIDA COUNTY.

Length, 7.10 miles.

Width of macadam, 14 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $70,500.

Contract dated, August 29, 1906.

Work commenced, September 12, 1906.

Work completed, 69 per cent.

Contractor, M. F. Dollard.

Engineers in charge, C. J. Myers and J. M. Howard.

This contract provides for the improvement of a section of the road from Oriskany Falls to Rome, extending from the Rome town line southerly to the Seneca turnpike. The macadam is 6 inches in thickness, all limestone.

PHŒNIX–PENNELLVILLE ROAD, NO. 450, OSWEGO COUNTY.

Length, 1.92 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $21,550.

Contract dated, September 20, 1907.

Contractor, Stewart-Kerbaugh-Shanley Company.

No work has been done under this contract.

CICERO–SOUTH BAY ROAD, NO. 452, ONONDAGA COUNTY.

Length, 3.53 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $33,100.

Contract dated, July 9, 1906.

Contractor, Wm. J. Dwyer.

No work has been done under this contract.

ITHACA ROAD, NO. 454, TOMPKINS COUNTY.

Length, 3.66 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $37,900.

Contract dated, August 30, 1906.

Work commenced, September 17, 1906.

Work completed, 89 per cent.

Contractor, County of Tompkins.

Engineers in charge, S. J. Stewart and William H. Snyder.

This contract provides for the improvement of a short section of road northerly from the city line of Ithaca along the east shore of Cayuga lake, also the road extending from the city line of Ithaca southwesterly toward Newfield. The macadam is constructed of 4 inches of local stone and 2 inches of limestone.

WYCKOFF ROAD, NO. 455, TOMPKINS COUNTY.

Length, 0.34 mile.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $4,500.

Contract dated, August 30, 1906.

Contractor, County of Tompkins.

No work has been done under this contract.

CATSKILL TURNPIKE (SECTION 3) ROAD, NO. 483, TOMPKINS COUNTY.

Length, 4.44 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $44,400.

Contract dated, August 30, 1906.

Work commenced, July 15, 1907.

Work completed, 7 per cent.

Contractor, County of Tompkins.

Engineer in charge, William H. Snyder.

This contract covers the third section of the Catskill turnpike between Ithaca and Slaterville Springs.

SKANEATELES WEST LAKE (SECTIONS 3, 4 AND 5) ROAD, NO. 486, ONONDAGA COUNTY.

Length, 3.37 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $37,000.

Contract dated, November 10, 1906.

Work commenced, April 9, 1907.

Work completed, 62 per cent.

Contractor, John Young.

Engineers in charge, J. Otis Burt and F. F. Miller.

This contract provides for the improvement of the balance of the road not covered by sections 1 and 2, from the Skaneateles village line along the west side of the lake to Mandana. The macadam is 6 inches in thickness, 4 inches of local stone and 2 inches of limestone.

ELBRIDGE ROAD, NO. 487, ONONDAGA COUNTY.

Length, 3.66 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $44,300.

Contract dated, November 10, 1906.

Work commenced, June 26, 1907.

Work completed, 11 per cent.

Contractor, Daniel V. Brown.

Engineer in charge, George H. Thomson.

This contract includes the improvement of the road from Elbridge north to Jordan; also from Elbridge west along the Genesee turnpike to the county line.

NORWICH-NORTH NORWICH ROAD, NO. 505, CHENANGO COUNTY.

Length, 4.60 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $45,848.

Contract dated, November 10, 1906.

Work commenced, April 8, 1907.

Work completed, 73 per cent.

Contractor, Daniel V. Brown.

Engineer in charge, S. B. McDonald.

This road is a continuation of North Broad street, Norwich, and extends from the village line toward North Norwich. The macadam is composed of limestone 6 inches in thickness.

CHITTENANGO-EAGLE VILLAGE ROAD, NO. 506, MADISON COUNTY.

Length, 2.18 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $21,700.

Contract dated, July 6, 1906.

Work commenced, July 25, 1906.

Work completed, 92 per cent.

Contractor, Wm. I. Tyler.

Engineer in charge, T. F. Nichols.

The improved highway extends from the village line of Chittenango westerly over the Seneca turnpike to the county line. The macadam is 6 inches in thickness, all local limestone.

OSWEGO–MEXICO (SECTION 1) ROAD, No. 509, OSWEGO COUNTY.

Length, 5.40 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $50,000.

Contract dated, July 6, 1906.

Work commenced, July 19, 1906.

Work completed, 99 per cent.

Contractors, Mott and Kemper.

Engineers in charge, E. H. Stewart and Harry H. Greene.

This road extends from the city line of Oswego easterly through Scriba Center toward Mexico. The macadam is 6 inches in thickness and is constructed of crushed fieldstone.

HOMER–TULLY (SECTION 1) ROAD, No. 510, CORTLAND COUNTY.

Length, 4.17 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $29,366.

Contract dated, July 10, 1906.

Work commenced, August 5, 1907.

Work completed, 7 per cent.

Contractor, John Weber and Sons, Inc.

Engineer in charge, C. J. Myers.

This road extends from the village line of Homer northerly on the east side of the valley toward Tully. The macadam is 6 inches in thickness, 4 inches of local stone and 2 inches of limestone.

MASSENA–WADDINGTON (SECTIONS 1, 2, 3 AND 4) ROAD, No. 521, ST. LAWRENCE COUNTY.

Length, 8.62 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $61,800.

Contract dated, September 20, 1907.

Contractor, Stewart-Kerbaugh-Shanley Company.

No work has been done under this contract.

CORTLAND-DRYDEN (SECTION 2) ROAD, NO. 535, CORTLAND COUNTY.

Length, 2.70 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $21,750.

Contract dated, September 20, 1907.

Contractor, Stewart-Kerbaugh-Shanley Company.

No work has been done under this contract.

UTICA-BRIDGEWATER ROAD, NO. 559, ONEIDA COUNTY.

Length, 9.09 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $81,000.

Contract dated, September 19, 1907.

Contractors, Casey and Murray.

No work has been done under this contract.

MOHAWK RIVER ROAD, ROME, NO. 560, ONEIDA COUNTY.

Length, 2.42 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $24,600.

Contract dated, September 19, 1907.

Work not started.

Contractors, Casey and Murray.

No work has been done under this contract, but it is expected that considerable work will be done before the close of the season.

AUBURN–SENECA FALLS (SECTION 1) ROAD, No. 590, CAYUGA COUNTY.

Length, 7.96 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $76,900.

Contract dated, November 10, 1906.

Work commenced, April 29, 1907.

Work completed, 22 per cent.

Contractor, The Scofield Company.

Engineer in charge, E. C. Clark.

This road extends westerly from the city line of Auburn toward Free Bridge over Seneca river.

The contractor's affairs have just passed into the hands of a receiver and all work has been suspended, leaving a long stretch of macadam laid and in an unfinished condition.

MORAVIA–NILES ROAD, No. 591, CAYUGA COUNTY.

Length, 10.85 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $89,800.

Contract dated, November 15, 1906.

Work commenced, April 8, 1907.

Work completed, 30 per cent.

Contractor, Jeremiah T. Finch.

Engineer in charge, A. L. Northrup.

This road extends from the village line of Moravia northerly over the Hollow creek road to the Onondaga county line. The macadam is 6 inches in thickness, all local limestone.

AUBURN–ELBRIDGE ROAD, No. 592, CAYUGA COUNTY.

Length, 5.61 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $55,400.

Contract dated, September 18, 1906.

Work commenced, April 15, 1907.

Work completed, 57 per cent.

Contractors, Chambers and Grady.

Engineer in charge, E. C. Clark.

This road extends from the city line of Auburn easterly through Sennett to the Onondaga county line. The macadam is 6 inches in thickness, all local limestone.

NORWICH–SOUTH NEW BERLIN (SECTION 1) ROAD, NO. 596, CHENANGO COUNTY.

Length, 3.42 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $35,900.

Contract dated, September 20, 1907.

Contractor, Stewart–Kerbaugh–Shanley Company.

No work has been done under this contract.

CAYUGA HEIGHTS–HANSHAW'S CORNERS ROAD, NO. 606, TOMPKINS COUNTY.

Length, 2.12 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $25,000.

Contract dated, September 20, 1907.

Contractor, Stewart–Kerbaugh–Shanley Company.

No work has been done under this contract.

AUBURN–OWASCO ROAD, NO. 614, CAYUGA COUNTY.

Length, 6.08 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $59,000.

Contract dated, September 20, 1907.

Contractor, Stewart–Kerbaugh–Shanley Company.

No work has been done under this contract.

TRUMANSBURG–ITHACA ROAD, NO. 616, TOMPKINS COUNTY.

Length, 8.66 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $94,500.

Contract dated, September 20, 1907.

Contractor, Stewart–Kerbaugh–Shanley Company.

No work has been done under this contract.

REPAIR CONTRACT No. 6, ROADS NOS. 125 AND 127, BROOME COUNTY.

Engineer's preliminary estimate, $5,200.

Contract dated, July 26, 1906.

Work commenced, November, 1906.

Work completed, 78 per cent.

Contractor, County of Broome.

Engineers in charge, R. J. Marcher and S. J. Stewart.

This contract consists in resurfacing sections of the roads with a new top course of trap-rock. The roads have a very unstable foundation, that of silt sand, which heaves badly with the frost and breaks up in the spring. Many breaks appeared and these were dug out and the macadam restored on a Telford foundation.

REPAIR CONTRACT No. 22, ROADS NOS. 3 AND 71, ONEIDA COUNTY.

Engineer's preliminary estimate, $7,340.

Contract dated, July 17, 1907.

Work commenced, September, 1907.

Work completed, 8 per cent.

Contractor, Joseph H. Conners.

Engineer in charge, George R. Winslow.

This contract calls for resurfacing portions of the roads which have rutted and worn from the extremely heavy traffic to which they are subjected.

REPAIR CONTRACT No. 23, ROAD No. 147, JEFFERSON COUNTY.

Engineer's preliminary estimate, $3,077.50.

Contract dated, July 17, 1907.

Work commenced, August, 1907.

Work completed, 73 per cent.

Contractor, Joseph H. Conners.

Engineer in charge, Frederick S. Strong.

This contract consists in resurfacing about three-fourths of a mile of the Burrs Mills road, which is subjected to heavy traffic from the sand and gravel pits to the city of Watertown.

REPAIR CONTRACT NO. 24, ROAD NO. 224, CHENANGO COUNTY.

Engineer's preliminary estimate, $6,200.
Contract dated, July 19, 1907.
Work commenced, August, 1907.
Work completed, 63 per cent.
Contractor, Douglas V. Ashley.
Engineer in charge, S. J. Stewart.

This road was originally improved with local stone, which is so soft that certain sections were practically worn out and required resurfacing. This work was done with trap-rock.

REPAIR CONTRACT NO. 25, ROADS NOS. 49 AND 121, ONONDAGA COUNTY.

Engineer's preliminary estimate, $8,562.50.
Contract dated, July 17, 1907.
Work commenced, August, 1907.
Work completed, 62 per cent.
Contractor, Joseph H. Conners.
Engineer in charge, N. E. Young.

This contract provided for resurfacing the entire length of these two roads. The original macadam had given good satisfaction, but had worn down so that resurfacing was necessary.

IMPROVEMENT OF PUBLIC HIGHWAYS.

Recapitulation of Work Done to September 30, 1907.

COUNTY.	Miles under contract during year ending Sept. 30, 1907.	Miles of plans and estimates completed prior to Sept. 30, 1906.	Miles of plans and estimates completed prior to Sept. 30, 1907.	Miles of plans and estimates completed during year ending Sept. 30, 1907.	Miles of surveys made during year ending Sept. 30, 1907.	Miles of contracts completed prior to Sept. 30, 1906.	Miles of contracts completed prior to Sept. 30, 1907.	Miles of contracts completed during year ending Sept. 30, 1907.
Broome	.....	62.71	62.71	.....	.....	14.54	23.99	9.45
Cayuga	28.06	29.78	35.86	6.08	34.14	.....	.....	.....
Chenango	8.02	44.96	78.19	33.23	20.15	15.34	21.09	5.75
Cortland	10.35	30.00	30.00	.....	23.08	4.45	6.22	1.77
Jefferson	9.98	90.41	108.04	17.63	0.36	20.92	27.84	6.92
Lewis	.....	12.64	12.64	.....	.....	.....	.....	.....
Madison	1.58	19.72	20.68	0.96	.....	.....	.....	.....
Oneida	18.77	91.28	94.74	3.46	54.02	12.35	16.09	3.74
Onondaga	13.00	81.34	110.06	28.72	42.06	10.93	12.65	1.72
Oswego	6.81	21.42	35.42	14.00	37.71	.....	0.48	0.48
St. Lawrence	8.62	47.67	47.67	.....	21.62	.....	.....	.....
Seneca	5.72	33.95	33.95	.....	8.19	.....	.....	.....
Tioga	.....	.....	.....	.....	.....	.....	.....	.....
Tompkins	10.78	14.86	25.64	10.78	6.75	1.87	1.87	.....
Totals	121.69	580.74	695.60	114.86	248.08	80.40	110.23	29.83

ROADS FOR WHICH CONTRACTS HAVE BEEN MADE UNDER CHAPTER 115, LAWS OF 1898, FROM SEPTEMBER 30, 1906, TO SEPTEMBER 30, 1907.

Road No.	NAME OF ROAD.	County.	Petition No.	Date of contract.	Length in miles.	Width of macadam, in feet.	Width of roadway, in feet.	Cubic yards excavation per mile.	KIND OF STONE.		Per cent completed to October 1, 1907.	Engineer's estimate.
									Bottom.	Top.		
208	Cortland-Homer	Cortland	250	Dec. 31, 1906	0.54	16-20	28-30	3,111	Limestone	Trap-rock	8	$8,600 00
236	Redwood-Alexandria Bay, section 2	Jefferson	342	Sept. 20, 1907	4.19	12-16-20	24-26-28-40	1,470	Granite	Limestone	....	38,200 00
245	Coleman Hill, section 1	Onondaga	10	Sept. 20, 1907	1.21	12	22-24-26	6,364	Limestone	Limestone	....	15,600 00
278	Syracuse-Watertown	Oswego	579	Sept. 20, 1907	2.41	16	26	1,772	Limestone	Limestone	....	26,950 00
279	West Oswego River	Oswego	114	Sept. 20, 1907	2.48	16	28	2,067	Limestone	Trap-rock	....	27,800 00
320	Reservation road, Fayette	Seneca	518a	Sept. 18, 1907	5.72	16	28	1,171	Limestone	Limestone	....	50,500 00
329	Valley road, Camillus	Onondaga	521	Nov. 23, 1906	2.32	12	24-26	4,828	Limestone	Limestone	51	34,400 00
330	Skaneateles Hamilton Turnpike, section 1	Onondaga	448	Sept. 20, 1907	2.44	14	22-24-26-28	3,893	Limestone	Limestone	....	28,500 00
337	Syracuse Turnpike	Madison	510	Sept. 20, 1907	1.58	12	26	2,136	Limestone	Limestone	....	13,800 00
368	Augusta road, Augusta	Oneida	319c	Nov. 23, 1906	3.38	14	28	Emb. 2,663	Limestone	Limestone	9	36,000 00
380	State road, Homer	Cortland	511	Nov. 14, 1906	4.39	12	24	Emb. 2,825	Fieldstone	Limestone	23	42,400 00
381	State road, Scott	Cortland	567	Sept. 20, 1907	2.72	12-16	24 26	1,728	Fieldstone	Limestone	....	27,300 00
384	Fleming	Cayuga	519	Nov. 10, 1906	3.17	12	24-26-28	2,366	Limestone	Limestone	26	31,960 00
406	Augusta road, Vernon Center	Oneida	319c	Nov. 27, 1906	3.88	14	24	Emb. 1,959	Limestone	Limestone	79	38,900 00
423	Watertown-Theresa, section 3	Jefferson	401	Sept. 20, 1907	4.19	12-16	22-26-28	1,420	Li. or gran.	Limestone	....	40,350 00
424	Belleville-Adams, section 1	Jefferson	439 782d	Nov. 16, 1906	1.60	12	26	Emb. 2,094	Limestone	Limestone	97	11,900 00
450	Phœnix-Pennellville	Oswego	778	Sept. 20, 1907	1.92	12-16	26	1,875	Limestone	Limestone	....	21,550 00
486	Skaneateles-West Lake, sections 3, 4 and 5	Onondaga	710 802 1,147	Nov. 10, 1906	3.37	12-16	26-30	2,359	Fieldstone	Limestone	62	37,000 00
487	Elbridge	Onondaga	447 708 1,145	Nov. 10, 1906	3.66	12-16	24-26-32	3,415	Limestone	Limestone	11	44,300 00
505	Norwich-North Norwich	Chenango	493 496	Nov. 10, 1906	4.60	12-16	20-22-24	2,826	Limestone	Limestone	73	46,848 00
521	Massena-Waddington, sections 1, 2, 3 and 4	St. L'rence	975 1,090 1,091	Sept. 20, 1907	8.62	12	26	2,144	Fieldstone	Limestone	....	61,800 00
535	Cortland-Dryden, section 2	Cortland	912j	Sept. 20, 1907	2.70	12	26	1,963	Fieldstone	Limestone	....	21,750 00
559	Utica-Bridgewater	Oneida	319d	Sept. 19, 1907	9.09	12-16	26-30-32	2,858	Limestone	Limestone	....	81,000 00

560	Mohawk River road, Rome	Oneida	1,271	Sept. 19, 1907	2.42	16	30-32	2,717	Fieldstone	Little Falls gneiss	....	24,600 00
590	Auburn-Seneca Falls	Cayuga	1,181 1,460	Nov. 10, 1906	7.96	12-16	24-26	Emb. 2,425	Limestone	Limestone	22	76,900 00
591	Moravia-Niles	Cayuga	1,162 1,470	Nov. 15, 1906	10.85	12	22-24	Emb. 2,488	Limestone	Limestone	30	89,800 00
596	Norwich-South New Berlin, section 1	Chenango	771p	Sept. 20, 1907	3.42	12	24	2,748	Fieldstone	Limestone	....	35,900 00
606	Cayuga Heights-Hanshaw's Corners	Tompkins	2,127 2,129	Sept. 20, 1907	2.12	12	24	3,738	Fieldstone	Limestone	....	25,000 00
614	Auburn-Owasco	Cayuga	1,161 1,461	Sept. 20, 1907	6.08	12	26	1,563	Limestone	Limestone	....	59,000 00
616	Trumansburg-Ithaca	Tompkins	1,422 1,496	Sept. 20, 1907	8.66	12	24	2,263	Fieldstone	Limestone	....	94,500 00

Much difficulty has been experienced during the past year in obtaining a sufficient number of assistant engineers and levelers to carry on the large increase in the work. The Civil Service list was almost continually exhausted, but we hope for better success in this respect next season.

I desire especially to thank yourself, your deputies, Mr. William R. Hill and Mr. Frank L. Getman, and First Resident Engineer Fred W. Sarr for the many acts of courtesy and uniform good-will. Financial clerk Peter Sheridan deserves mention for the efficient manner in which he has conducted his office. I also desire to express my appreciation of the manner in which a majority of the subordinates have assisted me with the work of the division, and to commend their faithful attention to the business of the department.

Respectfully submitted,
HENRY B. BREWSTER,
Division Engineer.

THE FOLLOWING STATEMENTS SHOW THE NAMES, RANK AND COMPENSATION OF ENGINEERS EMPLOYED IN THE MIDDLE DIVISION OF THE DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR, TOGETHER WITH INCIDENTAL EXPENSES, FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1907.

Ordinary Repairs to Canals — Erie Canal.

Chapter 683, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Henry B. Brewster	Division engineer	$3,600 per year	$487 50	$11 05	$498 55
Chas. O. McComb	Division engineer	3,600 per year	226 20	....	226 20
Fred W. Sarr	First resident engineer	225 00 per month	1,293 75	90	1,294 65
Peter Sheridan	Financial clerk	5 00 per day	310 00	9 34	319 34
L. D. Norton	Financial clerk	5 00 per day	220 00	70	220 70
Howard U. Lyon	Estimate clerk	5 00 per day	390 00	8 75	398 75
Clement A. Munger	Stenographer	75 00 per month	432 50	....	432 50
Harvey Wagner	Stenographer	1,000 per year	419 22	....	419 22
C. H. Morgan	Stenographer	75 00 per month	408 32	....	408 32
John P. Hart	Stenographer	2 00 per day	40 00	....	40 00
D. E. Whitford	Assistant engineer	5 00 per day	550 00	6 97	556 97
David R. Lee	Assistant engineer	6 00 per day	354 00	9 66	363 66
Geo. D. Williams	Assistant engineer	6 00 per day	174 00	2 55	176 55
J. Otis Burt	Assistant engineer	5 00 per day	140 00	....	140 00
Frederick S. Strong	Assistant engineer	6 00 per day	6 00	1 54	7 54
C. H. Mattison	Inspector	3 50 per day	28 00	15 09	43 09
Wm. S. Morris	Rodman	3 50 per day	574 00	....	574 00
R. E. Miller	Rodman	3 50 per day	10 50	....	10 50
Frank Lutz	Chainman	3 00 per day	45 00	....	45 00
R. B. Graham	Chainman	2 50 per day	2 50	....	2 50
John Connors	Laborer	2 00 per day	626 00	....	626 00
John O'Neil	Laborer	2 00 per day	62 00	....	62 00
J. L. Ames	Laborer	2 00 per day	6 00	....	6 00
					$6,872 04
Incidental Expenses.					
Livery				$15 30	
Stationery and printing				163 59	
Fuel and light				336 48	
Postage				110 22	
Telephone and telegraph				583 17	
Miscellaneous				817 27	
					2,026 03
Total					$8,898 07

Ordinary Repairs to Canals — Oswego Canal.

Chapter 683, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
D. E. Whitford	Assistant engineer	$5 00 per day	$10 00	$1 50	$11 50
Total					$11 50

Ordinary Repairs to Canals — Cayuga and Seneca Canal.

Chapter 683, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Fred W. Sarr..........	First resident engineer..........	$2,700 per year	$56 25	$2 18	$58 43
Total..........					$58 43

Ordinary Repairs to Canals — Black River Canal.

Chapter 683, Laws of 1906.

Incidental Expenses.

Miscellaneous..........	$32 60	$32 60
Total..........		$32 60

Construction of Barge Canal — Erie Canal.

Chapter 147, Laws of 1903.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Henry B. Brewster.....	Division engineer..........	$3,600 per year	$678 63	$82 35	$760 98
Chas. O. McComb......	Division engineer..........	3,600 per year	337 50	2 37	339 87
Guy Moulton..........	Resident engineer..........	200 00 per month	2,335 71	123 59	2,459 30
M. B. Palmer..........	Resident engineer..........	200 00 per month	1,677 42	141 74	1,819 16
Emile Low..........	Resident engineer..........	200 00 per month	1,200 00	92 31	1,292 31
Geo. T. Keith..........	Resident engineer..........	200 00 per month	400 00	51 80	451 80
Peter Sheridan..........	Financial clerk..........	5 00 per day	255 00	1 89	256 89
L. D. Norton..........	Financial clerk..........	5 00 per day	90 00	....	90 00
Howard U. Lyon..........	Estimate clerk..........	5 00 per day	480 00	40	480 40
C. H. Morgan..........	Stenographer..........	100 00 per month	299 99	....	299 99
G. W. Stickney..........	Assistant engineer..........	6 00 per day	1,884 00	67 30	1,951 30
Fred J. Wagner..........	Assistant engineer..........	6 00 per day	1,878 00	225 80	2,103 80
Carl L. Bannister..........	Assistant engineer..........	6 00 per day	1,878 00	83 14	1,961 14
Daniel B. Donovan..........	Assistant engineer..........	6 00 per day	1,851 00	928 28	2,779 28
Louis Garbi, Jr..........	Assistant engineer..........	5 00 per day	1,561 50	332 74	1,894 24
A. G. Crysler..........	Assistant engineer..........	5 00 per day	1,551 50	89 83	1,641 33
Louis A. Burns..........	Assistant engineer..........	6 00 per day	1,209 00	....	1,209 00
Willard O. White..........	Assistant engineer..........	6 00 per day	882 00	12 57	894 57
J. N. Slater..........	Assistant engineer..........	5 00 per day	840 00	....	840 00
Arthur J. O'Leary..........	Assistant engineer..........	6 00 per day	753 00	173 91	926 91
William W. Cronin..........	Assistant engineer..........	5 00 per day	465 00	....	465 00
Chas. W. Costello..........	Leveler..........	5 00 per day	1,551 50	139 25	1,690 75
E. J. Berry..........	Leveler..........	5 00 per day	1,525 00	17 18	1,542 18
N. R. McLoud..........	Leveler..........	5 00 per day	1,479 00	....	1,479 00
W. A. Lafler..........	Leveler..........	4 50 per day	1,287 00	36 00	1,323 00
Foster B. Crocker..........	Leveler..........	4 50 per day	1,159 00	5 30	1,164 30
C. H. Rogers..........	Leveler..........	4 50 per day	1,070 50	....	1,070 50
W. J. Durkan..........	Leveler..........	4 50 per day	823 50	81 22	904 72
Frederick G. Bennett..........	Leveler..........	4 50 per day	400 50	....	400 50
Harry C. Smith..........	Leveler..........	4 50 per day	220 50	....	220 50
Carl F. Hopstein..........	Draughtsman..........	4 00 per day	1,395 00	105 60	1,500 60
Albert G. Card..........	Draughtsman..........	4 00 per day	1,228 00	....	1,228 00
R. M. Fraser..........	Draughtsman..........	100 00 per month	1,190 58	....	1,190 58
Chas. E. Cruger..........	Draughtsman..........	50 00 per month	261 67	....	261 67
Jno. A. Pritchard..........	Draughtsman..........	50 00 per month	100 00	....	100 00
R. K. Sheldon..........	Draughtsman..........	4 00 per day	52 00	....	52 00
F. A. Gordon..........	Rodman..........	3 50 per day	421 00	....	421 00
Albert L. Sayer..........	Rodman..........	3 50 per day	326 00	....	326 00

Construction of Barge Canal — Erie Canal — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
P. H. Budd	Rodman	$3 50 per day	$294 00	$0 78	$294 78
Geo. H. Thomas	Rodman	4 00 per day	260 00		260 00
A. R. Morse	Rodman	3 50 per day	178 50		178 50
Hubert T. Arnold	Rodman	3 50 per day	161 00		161 00
Wm. S. Morris	Rodman	4 00 per day	156 00		156 00
Ralph M. Bennett	Rodman	3 50 per day	108 50	1 25	109 75
Henry C. Little	Chainman	2 50 per day	837 00	35 77	872 77
Harry C. Smith	Chainman	2 50 per day	296 00	4 08	300 08
Seward D. Hendricks	Chainman	2 50 per day	212 50	78	213 28
Frank Lutz	Chainman	3 00 per day	192 00		192 00
James M. Wilson	Chainman	2 50 per day	135 00		135 00
L. H. Rutherford	Chainman	2 50 per day	52 50		52 50
H. J. Stevens	Chainman	2 50 per day	17 50		17 50
M. V. McCoy	Foreman of borings	3 50 per day	903 00	19 01	922 01
H. W. Stoneburg	Foreman of borings	3 50 per day	542 50	50 41	592 91
Chas. R. Judson	Foreman of borings	3 50 per day	297 50	83 92	381 42
Fred H. Palmer	Foreman of borings	3 50 per day	245 00		245 00
A. G. Bohannan	Inspector	4 50 per day	1,179 00	42 48	1,221 48
Alfred Evans	Inspector	4 00 per day	944 00	2 21	946 21
C. H. Mattison	Inspector	3 50 per day	665 00	65 76	730 76
E. W. Parsons	Inspector	3 50 per day	203 00	24 04	227 04
Wm. H. Rundle	Boatman	3 00 per day	570 00		570 00
Victor C. Lewis	Boatman	3 00 per day	570 00		570 00
Oscar Svenson	Boatman	3 00 per day	393 00	3 16	396 16
James Keating	Boatman	3 00 per day	378 00		378 00
G. H. Lawless	Laborer	2 00 per day	48 00		48 00
Washington Jones	Laborer	2 00 per day	86 00		86 00
John J. Maloney	Laborer	2 00 per day	80 00		80 00
Howard B. Lincoln	Laborer	2 00 per day	32 00		32 00
Fred W. Harvey	Laborer	2 00 per day	50 00		50 00
Jno. J. Phalen	Laborer	2 00 per day	24 00		24 00
Lynn Gollands	Laborer	2 00 per day	82 00		82 00
J. L. Curtin	Laborer	2 00 per day	104 00		104 00
W. R. Mahar	Laborer	2 00 per day	96 00		96 00
Clarence Phelps	Laborer	2 00 per day	414 00	151 67	565 67
Fred Derrick	Laborer	2 00 per day	158 00		158 00
Wesley Jaquish	Laborer	2 00 per day	158 00		158 00
Henry Jaquish	Laborer	2 00 per day	158 00		158 00
Jerry Hart, Jr	Laborer	2 00 per day	54 00		54 00
Chas. McEllen	Laborer	2 00 per day	24 00		24 00
Allen McPherson	Laborer	2 00 per day	24 00		24 00
W. J. Larned, Jr	Laborer	2 00 per day	6 00		6 00
D. J. Fitzgerald	Laborer	2 00 per day	8 00		8 00
Jesse Foster	Laborer	2 00 per day	54 00		54 00
W. P. Rayland	Laborer	2 00 per day	364 00		364 00
M. C. Plunkett	Laborer	2 00 per day	386 00		386 00
Thomas McCann	Laborer	2 00 per day	274 00		274 00
Ward T. Marriott	Laborer	2 00 per day	380 00		380 00
Herbert Kane	Laborer	2 00 per day	58 00		58 00
Levi Odell	Laborer	2 00 per day	52 00		52 00
James Moore	Laborer	2 00 per day	52 00		52 00
Leo Lewis	Laborer	2 00 per day	70 00		70 00
M. H. Mahoney	Laborer	2 00 per day	28 00		28 00
Geo. E. Sweeting	Laborer	2 00 per day	36 00		36 00
M. J. Finneran	Laborer	2 00 per day	242 00		242 00
John W. Smith	Laborer	2 00 per day	362 00		362 00
Bird D. Kneeland	Laborer	2 00 per day	314 00		314 00
D. J. McCarthy	Laborer	2 00 per day	8 00		8 00
J. W. Howard	Laborer	2 00 per day	32 00		32 00
D. Vanalstine	Laborer	2 00 per day	14 00		14 00
George Scott	Laborer	2 00 per day	212 00		212 00
Joseph F. O'Brien	Laborer	2 00 per day	628 00		628 00
Irving Weller	Laborer	2 00 per day	190 00		190 00
William C. Miller	Laborer	2 00 per day	122 00		122 00
James Burns	Laborer	2 00 per day	34 00		34 00
Sylvester Willse	Laborer	2 00 per day	342 00		342 00
D. Cameron	Laborer	2 00 per day	158 00		158 00
Solomon Bloom	Laborer	2 00 per day	46 00		46 00
Edward Radford	Laborer	2 00 per day	164 00		164 00
Geo. Mechnish	Laborer	2 00 per day	240 00		240 00
Wm. T. Kehoe	Laborer	2 00 per day	320 00		320 00
J. L. Ames	Laborer	2 00 per day	210 00		210 00
James Kenyon	Laborer	2 00 per day	66 00		66 00

Construction of Barge Canal — Erie Canal — (Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Robert E. Gallivan	Laborer	$2 00 per day	$90 00	....	$90 00
David H. Doyle	Laborer	2 00 per day	146 00	....	146 00
Leon Darrow	Laborer	2 00 per day	84 00	....	84 00
A. W. Harrington	Laborer	2 00 per day	36 00	....	36 00
J. W. Main	Laborer	2 00 per day	146 00	....	146 00
J. Elmo Quinn	Laborer	2 00 per day	146 00	....	146 00
John File	Laborer	2 00 per day	194 00	....	194 00
Robert P. Britt	Laborer	2 00 per day	191 00	....	194 00
John Dougherty	Laborer	2 00 per day	78 00	....	78 00
Floyd C. Oatman	Laborer	2 00 per day	140 00	....	140 00
Cyrus Carpenter	Laborer	2 00 per day	140 00	....	140 00
David Rooney	Laborer	2 00 per day	140 00	....	140 00
Edward Strong	Gage reader	7 00 per month	77 00	....	77 00
Mrs. Augustus H. Hoffmeister	Gage reader	7 00 per month	84 00	....	84 00
A. D Barber	Gage reader	7 00 per month	14 00	....	14 00
Karl Hatch	Gage reader	7 00 per month	25 67	....	25 67
Raymer Powell	Gage reader	7 00 per mnoth	35 00	....	35 00
Wm. T. Crill	Gage reader	7 00 per month	84 00	....	84 00
Fred Miller	Gage reader	7 00 per month	84 00	....	84 00
Marie Powell	Gage reader	7 00 per month	49 00	....	49 00
Wm. B. Dempsey	Gage reader	7 00 per month	28 00	....	28 00
Solomon Walts	Gage reader	7 00 per month	84 00	....	84 00
Earl Williams	Gage reader	7 00 per month	19 19	....	19 19
Marie Brandt	Gage reader	7 00 per month	15 58	....	15 58
Julius Albeck	Gage reader	7 00 per month	16 03	....	16 03
Albert A. Fuller	Gage reader	7 00 per month	28 00	....	28 00
Daniel Brown	Gage reader	6 00 per month	80 00	....	80 00
John Phillips	Gage reader	6 00 per month	72 00	....	72 00
F. B. Randall	Gage reader	5 00 per month	60 00	....	60 00
E. A. Evans	Gage reader	5 00 per month	60 00	....	60 00
J. H. Rupert	Gage reader	5 00 per month	60 00	....	60 00
Ed. Jones	Gage reader	5 00 pe month	60 00	....	60 00
John P. Watts	Gage reader	5 00 per month	31 13	....	31 13
Joseph Kennedy	Gage reader	5 00 per month	35 00	....	35 00
Frank Shane	Gage reader	5 00 per month	60 00	....	60 00
Chas. E. Otis	Gage reader	5 00 per month	5 00	....	5 00
Mark Kennedy	Gage reader	5 00 per month	25 00	....	25 00
Frank Burns	Gage reader	5 00 per month	60 00	....	60 00
William Prettie	Gage reader	5 00 per month	60 00	....	60 00
A. J. Carlton	Gage reader	5 00 per month	45 00	....	45 00
John Chamberlin	Gage reader	5 00 per month	60 00	....	60 00
W. M. Hubbard	Gage reader	5 00 per month	60 00	....	60 00
Adniram Hart	Gage reader	5 00 per month	60 00	....	60 00
Louis McArthur	Gage reader	5 00 per month	70 00	....	70 00
Chas. Brannock	Gage reader	5 00 per month	80 00	....	80 00
Chas. Bourke	Gage reader	5 00 per month	60 00	....	60 00
Edward Carlton	Gage reader	5 00 per month	10 00	....	10 00
Bessie C. Kellogg	Gage reader	4 00 per month	48 00	....	48 00
Chas. E. Swan	Livery	....	....	$58 00	58 00
					$60,519 11

Incidental Expenses.

Instruments and tools	$609 71	
Stationery and printing	119 13	
Fuel and light	349 58	
Postage	180 06	
Office rent	609 03	
Telephone and telegraph	245 83	
Miscellaneous	5,840 50	
		7,953 84
Total		$68,472 95

Construction of Barge Canal — Oswego Canal.

Chapter 147, Laws 1903.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Henry B. Brewster	Division engineer	$3,600 per year	$404 04	$30 57	$434 61
Chas. O. McComb	Division engineer	3,600 per year	112 50	3 50	116 00
B. E. Failing	Resident engineer	200 per month	1,000 00	11 83	1,011 83
D. D. Waldo	Resident engineer	200 per month	943 26	10 67	953 93
H. W. De Graff	Resident engineer	200 per month	200 00	22 09	222 09
Peter Sheridan	Financial clerk	5 00 per day	310 00	....	310 00
Howard U. Lyon	Estimate clerk	5 00 per day	85 00	....	85 00
L. D. Norton	Financial clerk	5 00 per day	45 00	....	45 00
C. H. Morgan	Stenographer	100 per month	33 34	....	33 34
Jos. H. Young	Assistant engineer	6 00 per day	1,752 00	188 38	1,940 38
Edwin Styring	Assistant engineer	6 00 per day	1,752 00	....	1,752 00
Arthur T. O'Leary	Assistant engineer	6 00 per day	1,098 00	521 11	1,619 11
Geo. H. Haley	Assistant engineer	5 00 per day	585 00	103 30	688 30
Thos. R. Tetley, Jr	Assistant engineer	5 00 per day	575 00	61 20	636 20
Chas. A. Pohl	Assistant engineer	6 00 per day	216 00	....	216 00
Geo. C. Andrews	Leveler	4 50 per day	733 50	7 56	741 06
J. Otis Burt	Draughtsman	5 00 per day	510 00	3 09	513 09
Arthur T. Clark	Draughtsman	4 00 per day	304 00	....	304 00
Geo. D. Kellogg	Rodman	3 50 per day	307 50	3 96	311 46
Arthur L. Milinowski	Rodman	3 50 per day	210 00	21 35	231 35
Harry C. Smith	Rodman	3 50 per day	122 00	2 50	124 50
Paul H. Underwood	Rodman	3 50 per day	77 00	1 30	78 30
A. R. Morse	Rodman	3 50 per day	91 00	....	91 00
H, H. Brown	Rodman	3 50 per day	70 00	....	70 00
W. S. Morris	Rodman	4 00 per day	56 00	....	56 00
W. C. R. Pyne	Rodman	3 50 per day	24 50	....	24 50
A. W. Andrews	Rodman	3 50 per day	24 50	....	24 50
Edmund A. Dollard	Rodman	3 50 per day	17 50	50	18 00
Hugh Henderson, Jr	Chainman	2 50 per day	350 00	....	350 00
Harry C. Smith	Chainman	2 50 per day	217 50	....	217 50
H. W. Stoneburg	Foreman of borings	3 50 per day	332 00	110 54	442 54
Earl L. Keeler	Inspector	4 00 per day	884 00	33 82	917 82
C. H. Mattison	Inspector	3 50 per day	220 50	30 10	250 60
E. W. Parsons	Inspector	3 50 per day	3 50	6 25	9 75
Willis N. Dutcher	Inspector	4 00 per day	172 00	6 92	178 92
William Kelley	Boatman	3 00 per day	681 00	....	681 00
Thomas Redmond	Boatman	3 00 per day	453 00	....	453 00
Victor C. Lewis	Boatman	3 00 per day	334 50	50	335 00
William Graham	Laborer	2 00 per day	318 00	....	318 00
James Mehegan	Laborer	2 00 per day	314 00	....	314 00
William A. Thurston	Laborer	2 00 per day	296 00	15 41	311 41
A. J. Broenehan	Laborer	2 00 per day	228 00	....	228 00
E. H. Campau	Laborer	2 00 per day	72 00	....	72 00
E. M. Bonner	Laborer	2 00 per day	72 00	....	72 00
Harry C. Webb	Laborer	2 00 per day	72 00	....	72 00
Leo Lewis	Laborer	2 00 per day	44 00	50	44 50
James Kenyon	Laborer	2 00 per day	38 00	....	38 00
Walter B. Jewett	Laborer	2 00 per day	18 00	50	18 50
Frank M. Hughes	Gage reader	12 00 per month	144 00	....	144 00
George Archambo	Gage reader	6 00 per month	72 00	....	72 00
Smith Sharp	Gage reader	5 00 per month	65 00	....	65 00
J. M. Johnson	Gage reader	5 00 per month	60 00	....	60 00
Samuel L. Purdy	Gage reader	5 00 per month	60 00	....	60 00
D. D. Tompkins	Gage reader	5 00 per month	60 00	....	60 00
Milton Engle	Gage reader	5 00 per month	30 00	....	30 00
Roy L. Smith	Gage reader	5 00 per month	30 00	....	30 00
Thomson & Bogardus	Livery	....	....	21 00	21 00
H. J. Hughes	Livery	....	....	13 00	13 00
					$18,531 09

Incidental Expenses.

Instruments and tools	$41 32	
Stationery and printing	14 52	
Fuel and light	96 53	
Postage	71 00	
Office rent	250 00	
Telephone and telegraph	99 41	
Miscellaneous	419 70	
		992 48
Total		$19,523 57

Improvement of Public Highways.

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Henry B. Brewster	Division engineer	$3,600 per year	$1,091 13	$305 82	$1,396 95
Chas. O. McComb	Division engineer	3,600 per year	262 50	132 36	394 86
Fred W. Sarr	First resident engineer	225 per month	1,350 00	451 87	1,801 87
R. J. Marcher	Resident engineer	200 per month	918 00	131 68	1,049 68
H. P. Willis	Resident engineer	200 per month	400 00	57 90	457 90
Peter Sheridan	Financial clerk	5 00 per day	390 00	4 55	394 55
L. D. Norton	Financial clerk	5 00 per day	120 00	2 21	122 21
Howard U. Lyon	Estimate clerk	5 00 per day	630 00	....	630 00
C. H. Morgan	Stenographer	100 per month	258 35	....	258 35
Harvey Wagner	Stenographer	75 per month	37 50	....	37 50
Frederick S. Strong	Assistant engineer	6 00 per day	2,028 00	541 57	2,569 57
Spencer J. Stewart	Assistant engineer	6 00 per day	1,986 00	504 22	2,490 22
E. C. Clark	Assistant engineer	6 00 per day	1,938 00	582 16	2,520 16
T. F. Nichols	Assistant engineer	6 00 per day	1,890 00	167 08	2,057 08
Harvey F. Hawley	Assistant engineer	6 00 per day	1,878 00	....	1,878 00
Nathan E. Young	Assistant engineer	6 00 per day	1,878 00	496 95	2,374 95
Geo. R. Winslow	Assistant engineer	6 00 per day	1,878 00	933 06	2,811 06
Harry H. Greene	Assistant engineer	6 00 per day	1,715 50	270 77	1,986 27
Emerson H. Stewart	Assistant engineer	5 00 per day	1,605 00	165 49	1,770 49
Wm. H. Snyder	Assistant engineer	5 00 per day	1,585 00	114 76	1,699 76
C. J. Myers	Assistant engineer	5 00 per day	1,570 00	31 18	1,601 18
Thos. D. Ringwood	Assistant engineer	5 00 per day	1,460 50	66 28	1,526 78
Geo. D. Williams	Assistant engineer	6 00 per day	1,368 00	199 19	1,567 19
David R. Lee	Assistant engineer	6 00 per day	1,308 00	823 92	2,131 92
R. V. Collins	Assistant engineer	5 00 per day	1,074 50	76 51	1,151 01
L. D. Brownell	Assistant engineer	6 00 per day	1,070 00	235 29	1,305 29
J. Otis Burt	Assistant engineer	5 00 per day	930 00	38 25	968 25
J. W. Slater	Assistant engineer	6 00 per day	892 00	38 17	930 17
A. L. Northrup	Assistant engineer	5 00 per day	779 00	9 71	788 71
O. M. Severson	Assistant engineer	5 00 per day	562 00	15 03	577 03
Geo. H. Thompson	Assistant engineer	5 00 per day	535 00	5 26	540 26
D. C. Wedgworth	Assistant engineer	6 00 per day	516 00	310 69	826 69
F. F. Miller	Assistant engineer	5 00 per day	490 00	27 65	517 65
Louis A. Burns	Assistant engineer	5 00 per day	460 00	....	460 00
G. C. Mills	Assistant engineer	5 00 per day	320 00	12 25	332 25
Wm. W. Cronin	Assistant engineer	5 00 per day	275 00	78	275 78
Thos. R. Tetley, Jr	Assistant engineer	5 00 per day	215 00	311 36	526 36
D. E. Whitford	Assistant engineer	5 00 per day	160 00	....	160 00
Kieffer Lindsey	Assistant engineer	6 00 per day	36 00	12 37	48 37
Pitson J. Cleaver	Assistant engineer	7 00 per day	28 00	10 66	38 66
Joseph Burns	Assistant engineer	5 00 per day	25 00	....	25 00
Edward M. Ellis	Leveler	5 00 per day	1,635 00	50 15	1,685 15
W. W. Ewell	Leveler	4 50 per day	1,435 50	26 84	1,462 34
Smith O. Steere	Leveler	4 50 per day	1,408 50	9 29	1,417 79
George Yavroumis	Leveler	4 50 per day	1,408 50	10 70	1,419 20
Louis Oppenheim	Leveler	4 50 per day	1,381 50	12 21	1,393 71
Stephen B. McDonald	Leveler	4 50 per day	1,368 00	20 58	1,388 58
E. A. Dahmen	Leveler	4 50 per day	1,246 00	5 62	1,251 62
LeRoy J. McCarty	Leveler	4 50 per day	1,188 00	8 01	1,196 01
R. E. Miller	Leveler	4 50 per day	1,180 50	28 70	1,209 20
J. F. Barber	Leveler	4 50 per day	846 00	30 65	876 65
Jas. T. Schuyler	Leveler	4 50 per day	778 50	1 04	779 54
Geo. W. Bradley	Leveler	4 50 per day	634 50	5 55	640 05
W. J. Durkan	Leveler	4 50 per day	585 00	4 60	589 60
J. M. Howard	Leveler	4 50 per day	477 00	12 98	489 98
Albert L. Sayer	Leveler	4 50 per day	400 50	8 79	409 29
C. H. Rogers	Leveler	4 50 per day	364 50	....	364 50
A. H. Rossing	Leveler	4 50 per day	85 50	....	85 50
Edward M. Babcock	Leveler	4 50 per day	67 50	....	67 50
Frank C. Tolles	Leveler	4 50 per day	58 50	....	58 50
Vann R. Phillips	Draughtsman	4 00 per day	728 00	....	728 00
Henry J. O'Neil	Draughtsman	4 00 per day	580 00	....	580 00
Wilbur S. Saxton	Draughtsman	4 00 per day	307 50	....	307 50
Samuel W. Stewart	Draughtsman	4 00 per day	76 00	....	76 00
V. M. McConnell	Draughtsman	4 00 per day	72 00	....	72 00
Arthur T. Clark	Draughtsman	4 00 per day	48 00	2 96	50 96
J. F. Greathead	Draughtsman	4 00 per day	20 00	....	20 00
Geo. H. Thomas	Rodman	4 00 per day	1,008 00	21 69	1,029 69
F. A. Gordon	Rodman	3 50 per day	612 50	8 69	621 19
Geo. C. Hannon	Rodman	3 50 per day	611 50	6 75	618 25
Harry N. Haight	Rodman	4 00 per day	512 00	58 99	570 99
B. J. Finch	Rodman	3 50 per day	360 50	5 60	366 10
Rupert Sturtevant	Rodman	3 50 per day	504 00	6 50	510 50
Wm. S. Morris	Rodman	4 00 per day	500 00	....	500 00
Albert W. Thayer	Rodman	3 50 per day	364 00	2 96	366 96
Geo. H. Rekate	Rodman	3 50 per day	350 00	3 75	353 75
C. D. Murray	Rodman	3 50 per day	339 50	6 25	345 75

Improvement of Public Highways — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Reed W. Cady	Rodman	$3 50 per day	$336 00	$1 80	$337 80
John Beard	Rodman	3 50 per day	297 50	4 30	301 80
R. E. Swinney	Rodman	3 50 per day	290 50	47 95	338 45
Wm. H. Hilburn	Rodman	3 50 per day	287 00	6 64	293 64
S. W. Gage	Rodman	3 50 per day	255 50	55	256 05
Ralph W. Bennett	Rodman	3 50 per day	220 50	2 93	223 43
Wm. A. Spellman	Rodman	3 50 per day	192 50		192 50
Paul H. Underwood	Rodman	3 50 per day	175 00	4 75	179 75
L. Lee Hadley	Rodman	3 50 per day	147 00		147 00
A. S. Milinowski	Rodman	3 50 per day	63 00	1 15	64 15
J. F. Maher	Rodman	3 50 per day	56 00	5 36	61 36
Harry C. Smith	Rodman	3 50 per day	7 00	3 95	10 95
L. Kavanagh	Chainman	3 00 per day	966 00		966 00
D. W. Scripture	Chainman	3 00 per day	856 00	5 93	861 93
Raymond C. Pugh	Chainman	2 50 per day	782 50	8 56	791 06
R. B. Graham	Chainman	2 50 per day	777 50	9 40	786 90
Frank Lutz	Chainman	3 00 per day	717 00		717 00
Don A. Wilcox	Chainman	2 50 per day	475 50		475 50
Thos. M. Lawrence	Chainman	2 50 per day	365 00	5 39	370 39
Jerry P. Lynch	Chainman	2 50 per day	217 50		217 50
Thomas L. Way	Chainman	2 50 per day	165 00	5 05	170 05
Seward D. Hendricks	Chainman	2 50 per day	40 00	5 40	45 40
Philip Lighthall	Chainman	2 50 per day	7 50		7 50
A. W. Rogers	Inspector of highways	4 00 per day	1,222 00	8 53	1,230 53
Geo. J. Goehl	Inspector of highways	3 50 per day	1,067 50	35 66	1,103 16
A. H. Schutzow	Inspector of highways	3 50 per day	1,053 50	3 35	1,056 85
F. H. Mongin	Inspector of highways	3 50 per day	764 50	12 14	776 64
E. W. Parsons	Inspector of highways	3 50 per day	759 50	41 35	800 85
W. J. Wilds	Inspector of highways	3 50 per day	673 50	8 08	681 58
B. A. Redington	Inspector of highways	3 50 per day	614 50	3 00	617 50
W. E. McNasser	Inspector of highways	8 50 per day	567 00	5 90	572 90
Alex. Gauthier	Inspector of highways	3 50 per day	483 00	12 66	495 66
Grant A. Tibbals	Inspector of highways	3 50 per day	479 50	80	480 30
D. J. Fitzgerald	Inspector of highways	3 50 per day	476 50		476 50
Stewart A. Patterson	Inspector of highways	3 50 per day	311 50	1 52	313 02
Wilbur W. Bancroft	Inspector of highways	3 50 per day	255 50	8 61	264 14
Ernest W. Dalton	Inspector of highways	3 50 per day	248 50	7 24	255 74
Geo. W. Harrer	Inspector of highways	3 50 per day	182 00		182 00
C. H. Mattison	Inspector of highways	3 50 per day	178 50	27 58	206 08
M. D. Poulsen	Inspector of highways	3 50 per day	175 00	14 95	189 95
Chas. H. Roberts	Inspector of highways	3 50 per day	298 00	4 60	302 60
John Duigaan	Inspector of highways	3 50 per day	154 00		154 00
Willard D. Covey	Inspector of highways	3 50 per day	126 00		126 00
D. B. Stitt	Inspector of highways	3 50 per day	126 00		126 00
Chas. R. Madden	Inspector of highways	3 50 per day	98 00	6 46	104 46
H. S. Otman	Laborer	2 00 per day	172 00		172 00
Geo. R. Dorsey	Laborer	2 00 per day	144 00		144 00
H. K. Kenyon	Laborer	2 00 per day	146 00		146 00
C. S. Moyer	Laborer	2 00 per day	154 00		154 00
D. G. Priest	Laborer	2 00 per day	134 00		134 00
John O'Neil	Laborer	2 00 per day	108 00		108 00
Elmo Quinn	Laborer	2 00 per day	296 00		296 00
Warren Luther	Laborer	2 00 per day	472 00		472 00
J. G. Wynkoop	Laborer	2 00 per day	604 00		604 00
Henry Lockwood	Laborer	2 00 per day	18 00		18 00
J. Freshman	Laborer	2 00 per day	8 00		8 00
Chas. Evans	Laborer	2 00 per day	6 00		6 00
Anthony Manley	Laborer	2 00 per day	40 00		40 00
James Mulalley	Laborer	2 00 per day	426 00		426 00
J. L. Ames	Laborer	2 00 per day	102 00		102 00
W. P. Rayland	Laborer	2 00 per day	166 00		166 00
Martin Finneran	Laborer	2 00 per day	104 00		104 00
A. C. Clark	Laborer	2 00 per day	134 00		134 00
H. W. Ehle	Laborer	2 00 per day	120 00		120 00
Ward T. Marriott	Laborer	2 00 per day	146 00		146 00
Walter B. Jewett	Laborer	2 00 per day	362 00		362 00
C. A. Armstrong	Laborer	2 00 per day	14 00		14 00
Clark H. Norton	Laborer	2 00 per day	336 00		386 00
Jerry Hart	Laborer	2 00 per day	130 00		130 00
John W. Davin	Laborer	2 00 per day	334 00		334 00
Henry Turk	Laborer	2 00 per day	192 00		192 00
W. E. Barron	Laborer	2 00 per day	194 00		194 00
John Fitzgerald	Laborer	2 00 per day	194 00		194 00
Chas. Hike	Laborer	2 00 per day	374 00		374 00
Chas. Abel	Laborer	2 00 per day	336 00	180 30	516 30
Michael O'Toole	Laborer	2 00 per day	14 00		14 00
Harry Donnelly	Laborer	2 00 per day	170 00		170 00
Robert Gallivan	Laborer	2 00 per day	158 00		158 00

Improvement of Public Highways — (Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Kent Haven	Laborer	$2 00 per day	$72 00		$72 00
W. H. Davis	Laborer	2 00 per day	144 00		144 00
Thos. F. Gray	Laborer	2 00 per day	198 00		198 00
J. H. Barry, Jr	Laborer	2 00 per day	158 00		158 00
Thomas Kennedy	Laborer	2 00 per day	156 00		156 00
Daniel Welch	Laborer	2 00 per day	144 00		144 00
Allen S. Field	Laborer	2 00 per day	302 00		302 00
R. C. Turner	Laborer	2 00 per day	80 00		80 00
Fred M. Cronin	Laborer	2 00 per day	170 00		170 00
Carl Dillenbeck	Laborer	2 00 per day	316 00		316 00
G. W. Bacon	Laborer	2 00 per day	216 00		216 00
Chas. R. McEllen	Laborer	2 00 per day	290 00		290 00
N. R. Elliott	Laborer	2 00 per day	134 00		134 00
Edward Dowdle	Laborer	2 00 per day	178 00	$11 50	189 50
Max Miller	Laborer	2 00 per day	132 00		132 00
Allen J. McPherson	Laborer	2 00 per day	296 00		296 00
Stanley B. Worden	Laborer	2 00 per day	218 00		218 00
Carroll I. Stratton	Laborer	2 00 per day	288 00		288 00
Robert Wilcox	Laborer	2 00 per day	186 00		186 00
Michael J. McCarthy	Laborer	2 00 per day	14 00		14 00
Fred W. Harvey	Laborer	2 00 per day	214 00		214 00
J. H. Wallace	Laborer	2 00 per day	246 00		246 00
David McCarthy	Laborer	2 00 per day	166 00		166 00
F. M. Hazard	Laborer	2 00 per day	132 00		132 00
W. F. Wingate	Laborer	2 00 per day	142 00		142 00
J. W. Baker	Laborer	2 00 per day	254 00		254 00
Chas. E. Kearney	Laborer	2 00 per day	228 00	1 85	229 85
James Burns	Laborer	2 00 per day	78 00		78 00
Justin McCarthy	Laborer	2 00 per day	6 00	5 20	11 20
B. J. Reilly	Laborer	2 00 per day	168 00		168 00
Edward Golden	Laborer	2 00 per day	302 00		302 00
Peter J. Blake	Laborer	2 00 per day	312 00		312 00
W. C. Miller	Laborer	2 00 per day	134 00		134 00
Cornelius Haley	Laborer	2 00 per day	136 00		136 00
John L. Curtin	Laborer	2 00 per day	30 00		30 00
Blynn H. Buell	Laborer	2 00 per day	306 00		306 00
Frank D. Griffin	Laborer	2 00 per day	304 00		304 00
Louis Heineman	Laborer	2 00 per day	278 00		278 00
Thomas Dolan	Laborer	2 00 per day	182 00		182 00
Wm. R. Curley	Laborer	2 00 per day	182 00		182 00
Chas. Delaney	Laborer	2 00 per day	182 00		182 00
E. H. Campau	Laborer	2 00 per day	22 00		22 00
Harry C. Webb	Laborer	2 00 per day	22 00		22 00
E. M. Bonner	Laborer	2 00 per day	22 00		22 00
M. L. Condon	Laborer	2 00 per day	130 00		130 00
Alfred Schillinger	Laborer	2 00 per day	108 00		108 00
A. W. Harrington	Laborer	2 00 per day	18 00		18 00
Solomon Bloom	Laborer	2 00 per day	394 00		394 00
James Moore	Laborer	2 00 per day	180 00		180 00
Frank J. Lynch	Laborer	2 00 per day	406 00		406 00
James A. Doyle	Laborer	2 00 per day	26 00		26 00
G. W. Ludington	Laborer	2 00 per day	64 00		64 00
John Cahill	Laborer	2 00 per day	156 00		156 00
Gordon Sullivan	Laborer	2 00 per day	26 00		26 00
Maurice Stack	Laborer	2 00 per day	32 00		32 00
John Hayes	Laborer	2 00 per day	26 00		26 00
John Fitzgibbons	Laborer	2 00 per day	26 00		26 00
Timothy Donovan	Laborer	2 00 per day	32 00		32 00
Samuel M. Stewart	Laborer	2 00 per day	32 00		32 00
D. C. Howard	Laborer	2 00 per day	22 00		22 00
Louis M. Cowen	Laborer	2 00 per day	66 00		66 00
J. M. O'Gorman	Laborer	2 00 per day	56 00		56 00
Henry Van Bliet	Laborer	2 00 per day	6 00	3 87	9 87
C. H. Lawless	Laborer	2 00 per day	10 00		10 00
					$103,351 62

Incidental Expenses.

Livery	$5,321 12	
Stationery and printing	127 79	
Fuel and light	237 26	
Postage	170 11	
Office rent	688 64	
Telephone and telegraph	300 48	
Miscellaneous	3,511 79	
		10,357 19
Total		$113,708 81

Maintenance and Repairs of Improved Public Highways.

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906; Chapter 686, Laws of 1906.

Road No.	NAME OF ROAD.	Town.	County.	Total.
214...	River road, Windsor, section 1.....	Windsor..........................	Broome........	$51 75
213...	River road, Windsor, section 2.....	Windsor..........................	Broome........	101 33
210...	Harpursville.....................	Colesville.......................	Broome........	35 75
174...	Endicott.........................	Union............................	Broome........	178 60
175...	Chenango Towpath.................	Fenton...........................	Broome........	259 97
209...	Nineveh..........................	Colesville.......................	Broome........	109 15
224...	Oxford–McDonough.................	Oxford, Preston and McDonough..	Chenango.......	489 89
112...	Norwich–Plymouth.................	Norwich and Plymouth...........	Chenango.......	1,511 07
218...	Greene–Smithville Flats...........	Smithville.......................	Chenango.......	402 74
225...	Guilford road....................	Guilford.........................	Chenango.......	160 05
40...	Cuyler...........................	Truxton..........................	Cortland.......	183 67
123...	Preble–Homer.....................	Preble...........................	Cortland.......	537 77
215...	Dryden...........................	Cortlandville....................	Cortland.......	12 64
111...	Blodgetts Mills..................	Cortlandville....................	Cortland.......	211 81
147...	Burrs Mills......................	Watertown and Rutland..........	Jefferson.......	97 23
183...	Adams–Henderson, section 1.......	Adams............................	Jefferson.......	1,373 83
181...	Watertown-Sacketts Harbor-Henderson, section 1..................	Hounsfield.......................	Jefferson.......	246 17
184...	Pierrepont Manor–Ellisburg........	Ellisburg........................	Jefferson.......	346 71
185...	State road.......................	Lorraine.........................	Jefferson.......	11 50
71...	Utica–Paris......................	New Hartford.....................	Oneida.........	1,105 55
3...	Deerfield........................	Deerfield........................	Oneida.........	485 20
48...	West Lake........................	Skaneateles......................	Onondaga......	237 18
76...	La Fayette.......................	La Fayette.......................	Onondaga......	211 55
122...	East Lake........................	Skaneateles......................	Onondaga......	71 40
49...	Fabius–Apulia, section 1..........	Fabius...........................	Onondaga......	572 76
75...	Fabius–Apulia, section 2	Fabius...........................	Onondaga......	261 60
......	Residency Office.................	....	Onondaga......	2,100 00
	Total............................	....	....	$11,366 87

North Salina Street Bridge, Syracuse.

Chapter 686, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
D. C. Wedgeworth......	Assistant engineer..............	$6 00 per day	$42 00	....	$42 00
L. D. Brownell.........	Assistant engineer..............	6 00 per day	24 00	....	24 00
					$66 00

Incidental Expenses.

Miscellaneous..	$592 20	592 20
Total..		$658 20

Brasher Falls Dam — St. Regis River.

Chapter 230, Laws of 1906; Chapter 686, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
David R. Lee..........	Assistant engineer..............	$6 00 per day	$246 00	$5 30	$251 30
					$251 30

Incidental Expenses.

Postage..	$0 40	
Miscellaneous..	55	95
Total..		$252 25

Surveys for State Court of Claims.

Chapter 700, Laws of 1905; Chapter 686, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Guy Moulton	Resident engineer	$2,400 per year	$114 29	$3 50	$117 79
D. E. Whitford	Assistant engineer	5 00 per day	845 00	....	845 00
L. D. Brownell	Assistant engineer	5 00 per day	731 00	320 81	1,051 81
Wm. W. Cronin	Assistant engineer	5 00 per day	45 00	....	45 00
Fred J. Wagner	Assistant engineer	6 00 per day	24 00	13 60	37 60
R. V. Collins	Leveler	4 50 per day	396 00	....	396 00
E. J. Berry	Leveler	5 00 per day	55 00	9 33	64 33
C. H. Mattison	Inspector	3 50 per day	3 50	35	3 85
R. C. Pugh	Chainman	2 50 per day	7 50	....	7 50
Don A. Wilcox	Laborer	2 00 per day	160 00	....	160 00
B. A. Redington	Laborer	2 00 per day	66 00	....	66 00
J. H. Mullaley	Laborer	2 00 per day	60 00	....	60 00
J. L. Ames	Laborer	2 00 per day	8 00	....	8 00
J. G. Wynkoop	Laborer	2 00 per day	2 00	....	2 00
					$2,864 88
Incidental Expenses.					
Livery				$44 45	
Stationery and printing				45	
Postage				54	
Telephone and telegraph				1 00	
Miscellaneous				96 30	
					142 74
Total					$3,007 62

SUMMARY.

The foregoing tables are summarized as follows:

	Ordinary Repairs to Canals.	
1.	Erie canal, chapter 683, Laws of 1906	$8,898 07
2.	Oswego canal, chapter 683, Laws of 1906	11 50
3.	Cayuga and Seneca canal, chapter 683, Laws of 1906	58 43
4.	Black River canal, chapter 683, Laws of 1906	32 00
	Construction of Barge Canal.	
5.	Construction of Barge canal, Erie canal, chapter 147, Laws of 1903	68,472 95
6.	Construction of Barge canal, Oswego canal, chapter 147, Laws of 1903	19,523 57
	Improvement of Public Highways.	
7.	Improvement of public highways, chapter 115, Laws of 1898; chapter 468, Laws of 1906	113,708 81
8.	Maintenance and repairs of improved public highways, chapter 115, Laws of 1898; chapter 468, Laws of 1906; chapter 686, Laws of 1906	11,366 87
	Special Work.	
9.	North Salina street bridge, Syracuse, chapter 686, Laws of 1906	658 20
10.	Brasher Falls dam, St. Regis river, chapter 729, Laws of 1904; chapter 700, Laws of 1905; chapter 230, Laws of 1906; chapter 686, Laws of 1906	252 25
	Special Surveys.	
11.	Surveys for State Court of Claims, chapter 700, Laws of 1905; chapter 686, Laws of 1906	3,007 62
	Total	$225,990 27

TABLE OF CONTRACTS COMPLETED ON THE MIDDLE DIVISION DURING THE FISCAL YEAR ENDING SEPTEMBER 30, 1907.

CONTRACTOR.	Date of contract.	Character of work.	ACT.		Appropriation.	Contract price.	Final payment.
			Chap.	Year.			
B. P. Clark.........	Aug. 22, 1906	Constructing a new apron and repairing State dam at Brasher Falls.............................	729 700 230 686	1904 1905 1906 1906	$5,510 03	$5,038 25	$4,737 66
H. W. Fisher.......	June 13, 1907	Constructing a vertical retaining wall on the Oneida feeder, Oneida..............................	686	1906	4,500 00	4,114 77	3,992 55

TABLE OF CONTRACTS COMPLETED ON THE MIDDLE DIVISION DURING THE FISCAL YEAR ENDING SEPTEMBER 30, 1907 (Continued).

Improvement of Public Highways.

Chapter 115, Laws of 1898, and amendatory laws

CONTRACTOR.	Date of contract.	Character of work.	Contract price.	Final payment.
County of Broome	June 16, 1904	Endicott road, No. 174, Broome county	$19,000 00	$20,618 20
J. Francis Ward	Aug 1, 1906	Additional work, State road, No. 185, Jefferson county	1,215 00	1,215 00
County of Broome	June 16, 1904	Center Village road, No. 211, Broome county	4,740 00	4,480 84
County of Broome	June 16, 1904	Ouaquaga road, No. 212, Broome county	8,240 00	8,007 02
County of Broome	June 16, 1904	River road, Windsor (section 2), No. 213, Broome county	22,000 00	28,[illegible] 30
County of Broome	June 16, 1904	River road, Windsor (section 1), No. 214, Broome county	12,704 00	14,051 44
Douglas V. Ashley	July 13, 1904	Guilford road, No. 225, Chenango county	41,348 00	42,004 79
Brennan & O'Brien	July 9, 1906	Sacketts Harbor road, No. 237, Jefferson county	10,887 00	11,212 02
County of Broome	July 12, 1906	Bridge road, No. 268, Broome county	9,053 68	9,724 43
Casey & Murray	July 10, 1906	Mohawk River road, Deerfield, No. 297, Oneida county	31,450 00	38,100 17
The Barnett Contracting Co	Sept 18, 1906	Minetto road, No. 370, Oswego county	6,170 00	6,054 48
Charles H. Quereau	July 10, 1906	Cincinnatus road, No. 377, Cortland county	3,650 00	3,614 41
Celestin C. Burns	July 7, 1906	Watertown–Carthage (section 2) road, No. 427, Jefferson county	37,[illegible]50 00	38,018 85
J. Charles Dayton	July 20, 1906	Jordan Valley (section 1) road, No. 430, Onondaga county	13,707 00	13,916 37
Douglas V. Ashley	July 10, 1906	Cortland–Groton (section 1) road, No. 446, Cortland county	9,782 00	9,614 08
J. Francis Ward	Aug. 1, 1906	Repair contract No. 4, Road No. 147, Jefferson county	9,000 00	9,502 05

TABLE OF CONTRACTS PENDING ON THE MIDDLE DIVISION, SEPTEMBER 30, 1907.

CONTRACTOR.	Date of contract.	Character of work.	ACT.		Appropriation.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
			Chapter.	Year.				
National Construction Co..	Nov. 1, 1906	Constructing stairways for the lift bridge at Catharine street, Syracuse........	683	1906	$1,500 00	$1,065 50	$1,500 00	....
John M. Schultz..........	Jan. 15, 1907	Constructing a lift bridge over the Oswego canal at North Salina street, Syracuse..........................	668	1906	*75,000 00	62,621 00	65,686 00	....

* $31,250 appropriated by city of Syracuse and $12,500 by Syracuse Rapid Transit Railway.

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Empire Engineering Corporation.....	April 18, 1905	Contract No. 4, Erie canal....................	$812,560 00	$726,815 00	$148,572 00
Empire Engineering Corporation.....	April 18, 1905	Contract No. 5, Erie canal....................	421,252 50	381,987 50	104,679 00
The Groton Bridge Co..............	Aug. 10, 1906	Contract No. 7, bridges on sections 5 and 7, Erie canal..................................	39,883 30	38,125 80	....

TABLE OF CONTRACTS PENDING ON THE MIDDLE DIVISION, SEPTEMBER 30, 1907 — (Continued).

Construction of Barge Canal — (Continued).

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Mosier & Summers	June 7, 1906	Contract No. 10, Oswego canal	$1,149,988 00	$1,126,718 00	$64,107 00
Stewart-Kerbaugh-Shanley Co	Sept. 23, 1907	Contract No. 12, Erie canal	3,082,560 00	3,391,716 00	....
Gilmour-Horton-Allen Co	Sept. 16, 1907	Contract No. 35, Oswego canal	752,760 00	739,261 00	....

Improvement of Public Highways.

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
John Weber & Sons, Inc	Dec. 31, 1906	Cortland-Homer road, No. 208, Cortland county	$8,600 00	$7,545 00	$543 24
Celestin C. Burns	July 7, 1906	Adams-Henderson (section 2) road, No. 234, Jefferson county	49,950 00	45,176 00	24,422 62
Celestin C. Burns	July 7, 1906	Watertown-Sacketts Harbor-Henderson (section 2) road, No. 235, Jefferson county	15,180 00	13,962 00	15,411 55
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Redwood-Alexandria Bay (section 2) road, No. 236, Jefferson county	38,200 00	35,467 20	....
Celestin C. Burns	July 7, 1906	Henderson Harbor road, No. 238, Jefferson county	30,450 00	27,858 00	20,070 49
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Coleman Hill (section 1) road, No. 245, Onondaga county	15,600 00	14,716 45	....

TABLE OF CONTRACTS PENDING ON THE MIDDLE DIVISION, SEPTEMBER 30, 1907 — (Continued).

Improvement of Public Highways — (Continued).

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Casey & Murray	July 10, 1906	Utica-Oneida Castle (section 1) road, No. 250, Oneida county	$144,100 00	$133,050 00	$122,208 56
County of Broome	July 12, 1906	Deposit road, No. 265, Broome county	30,000 00	26,474 70	16,917 34
County of Broome	July 12, 1906	Tunnel road, No. 266, Broome county	13,750 00	13,319 00	4,195 49
County of Broome	July 12, 1906	Castle Creek road, No. 267, Broome county	54,750 00	54,662 70	42,308 93
Casey & Murray	Sept. 15, 1906	Utica-Oneida Castle (section 2) road, No. 271, Oneida county	86,500 00	79,800 00	11,673 90
County of Broome	July 12, 1906	Gulf Bridge (section 1) road, No. 274, Broome county	15,250 00	14,406 28	11,928 40
County of Broome	July 12, 1906	Union-Maine road, No. 275, Broome county	31,500 00	30,604 00	6,059 59
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Syracuse-Watertown road, No. 278, Oswego county	26,950 00	23,475 80	....
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	West Oswego River road, No. 279, Oswego county	27,800 00	25,423 35	....
The Barnett Contracting Co	Sept. 18, 1906	Oswego-Sterling road, No. 280, Oswego county	13,550 00	12,700 00	12,970 80
Wm. J. Dwyer	Aug. 31, 1906	South Salina street road, No. 290, Onondaga county	13,900 00	12,200 00	8,564 40
Chas. H. Quereau	July 10, 1906	West Lake (section 2) road, No. 292, Onondaga county	10,550 00	9,350 00	....
Chas. H. Quereau	July 10, 1906	East Lake (section 2) road, No. 293, Onondaga county	9,500 00	8,750 00	2,992 50
Casey & Murray	July 10, 1906	Mohawk River road, Floyd, No. 295, Oneida county	29,750 00	26,750 00	18,812 70
Casey & Murray	July 10, 1906	Mohawk River road, Marcy, No. 296, Oneida county	49,200 00	43,250 00	43,530 30
H. C. Schroeder	Sept. 18, 1907	Reservation road, Fayette, No. 320, Seneca county	50,500 00	45,743 15	....
Wm. J. Dwyer	Aug. 31, 1906	Valley road, Marcellus, No. 328, Onondaga county	19,500 00	17,300 00	778 50
Chas. H. Quereau	Nov. 23, 1906	Valley road, Camillus, No. 329, Onondaga county	34,400 00	30,250 00	13,884 75
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Skaneateles-Hamilton turnpike (section 1) road, No. 330, Onondaga county	28,500 00	27,093 00	....
County of Tompkins	Aug. 30, 1906	Cayuga Heights road, No. 336, Tompkins county	37,400 00	33,182 00	4,180 93
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Syracuse turnpike road, No. 337, Madison county	13,800 00	12,525 30	....
County of Tompkins	Aug. 30, 1906	Catskill turnpike (section 2) road, No. 338, Tompkins county	14,900 00	13,111 00	4,247 96

Improvement of Public Highways — (Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Kent Haven	Laborer	$2 00 per day	$72 00	.....	$72 00
W. H. Davis	Laborer	2 00 per day	144 00	....	144 00
Thos. F. Gray	Laborer	2 00 per day	198 00	....	198 00
J. H. Barry, Jr	Laborer	2 00 per day	158 00	....	158 00
Thomas Kennedy	Laborer	2 00 per day	156 00	....	156 00
Daniel Welch	Laborer	2 00 per day	144 00	....	144 00
Allen S. Field	Laborer	2 00 per day	302 00	....	302 00
R. C. Turner	Laborer	2 00 per day	80 00	....	80 00
Fred M. Cronin	Laborer	2 00 per day	170 00	....	170 00
Carl Dillenbeck	Laborer	2 00 per day	316 00	....	316 00
G. W. Bacon	Laborer	2 00 per day	216 00	....	216 00
Chas. R. McEllen	Laborer	2 00 per day	290 00	....	290 00
N. R. Elliott	Laborer	2 00 per day	134 00	....	134 00
Edward Dowdle	Laborer	2 00 per day	178 00	$11 50	189 50
Max Miller	Laborer	2 00 per day	132 00	....	132 00
Allen J. McPherson	Laborer	2 00 per day	296 00	....	296 00
Stanley B. Worden	Laborer	2 00 per day	218 00	....	218 00
Carroll I. Stratton	Laborer	2 00 per day	288 00	....	288 00
Robert Wilcox	Laborer	2 00 per day	186 00	....	186 00
Michael J. McCarthy	Laborer	2 00 per day	14 00	....	14 00
Fred W. Harvey	Laborer	2 00 per day	214 00	....	214 00
J. H. Wallace	Laborer	2 00 per day	246 00	....	246 00
David McCarthy	Laborer	2 00 per day	166 00	....	166 00
F. M. Hazard	Laborer	2 00 per day	132 00	....	132 00
W. F. Wingate	Laborer	2 00 per day	142 00	....	142 00
J. W. Baker	Laborer	2 00 per day	254 00	....	254 00
Chas. E. Kearney	Laborer	2 00 per day	228 00	1 85	229 85
James Burns	Laborer	2 00 per day	78 00	....	78 00
Justin McCarthy	Laborer	2 00 per day	6 00	5 20	11 20
B. J. Reilly	Laborer	2 00 per day	168 00	....	168 00
Edward Golden	Laborer	2 00 per day	302 00	....	302 00
Peter J. Blake	Laborer	2 00 per day	312 00	....	312 00
W. C. Miller	Laborer	2 00 per day	134 00	....	134 00
Cornelius Haley	Laborer	2 00 per day	136 00	....	136 00
John L. Curtin	Laborer	2 00 per day	30 00	....	30 00
Blynn H. Buell	Laborer	2 00 per day	306 00	....	306 00
Frank D. Griffin	Laborer	2 00 per day	304 00	....	304 00
Louis Heineman	Laborer	2 00 per day	278 00	....	278 00
Thomas Dolan	Laborer	2 00 per day	182 00	....	182 00
Wm. R. Curley	Laborer	2 00 per day	182 00	....	182 00
Chas. Delaney	Laborer	2 00 per day	182 00	....	182 00
E. H. Campau	Laborer	2 00 per day	22 00	....	22 00
Harry C. Webb	Laborer	2 00 per day	22 00	....	22 00
E. M. Bonner	Laborer	2 00 per day	22 00	....	22 00
M. L. Condon	Laborer	2 00 per day	130 00	....	130 00
Alfred Schillinger	Laborer	2 00 per day	108 00	....	108 00
A. W. Harrington	Laborer	2 00 per day	18 00	....	18 00
Solomon Bloom	Laborer	2 00 per day	394 00	....	394 00
James Moore	Laborer	2 00 per day	180 00	....	180 00
Frank J. Lynch	Laborer	2 00 per day	406 00	....	406 00
James A. Doyle	Laborer	2 00 per day	26 00	....	26 00
G. W. Ludington	Laborer	2 00 per day	64 00	....	64 00
John Cahill	Laborer	2 00 per day	156 00	....	156 00
Gordon Sullivan	Laborer	2 00 per day	26 00	....	26 00
Maurice Stack	Laborer	2 00 per day	32 00	....	32 00
John Hayes	Laborer	2 00 per day	26 00	....	26 00
John Fitzgibbons	Laborer	2 00 per day	26 00	....	26 00
Timothy Donovan	Laborer	2 00 per day	32 00	....	32 00
Samuel M. Stewart	Laborer	2 00 per day	32 00	....	32 00
D. C. Howard	Laborer	2 00 per day	22 00	....	22 00
Louis M. Cowen	Laborer	2 00 per day	66 00	....	66 00
J. M. O'Gorman	Laborer	2 00 per day	56 00	....	56 00
Henry Van Bliet	Laborer	2 00 per day	6 00	3 87	9 87
C. H. Lawless	Laborer	2 00 per day	10 00	....	10 00
					$103,351 62

Incidental Expenses.

Livery	$5,321 12	
Stationery and printing	127 79	
Fuel and light	237 26	
Postage	170 11	
Office rent	688 64	
Telephone and telegraph	300 48	
Miscellaneous	3,511 79	
		10,357 19
Total		$113,708 81

Maintenance and Repairs of Improved Public Highways.

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906; Chapter 686, Laws of 1906.

Road No.	NAME OF ROAD.	Town.	County.	Total.
214...	River road, Windsor, section 1......	Windsor..........................	Broome........	$51 75
213...	River road, Windsor, section 2......	Windsor..........................	Broome........	101 33
210...	Harpursville......................	Colesville........................	Broome........	35 75
174...	Endicott..........................	Union............................	Broome........	178 60
175...	Chenango Towpath..................	Fenton...........................	Broome........	259 97
209...	Nineveh...........................	Colesville........................	Broome........	109 15
224...	Oxford-McDonough..................	Oxford, Preston and McDonough..	Chenango.......	489 89
112...	Norwich-Plymouth..................	Norwich and Plymouth...........	Chenango.......	1,511 07
218...	Greene-Smithville Flats............	Smithville........................	Chenango.......	402 74
225...	Guilford road......................	Guilford..........................	Chenango.......	160 05
40...	Cuyler............................	Truxton..........................	Cortland.......	183 67
123...	Preble-Homer......................	Preble...........................	Cortland.......	537 77
215...	Dryden............................	Cortlandville.....................	Cortland.......	12 64
111...	Blodgetts Mills....................	Cortlandville.....................	Cortland.......	211 81
147...	Burrs Mills........................	Watertown and Rutland..........	Jefferson.......	97 23
183...	Adams-Henderson, section 1.......	Adams............................	Jefferson.......	1,373 83
181...	Watertown-Sacketts Harbor-Henderson, section 1..................	Hounsfield.......................	Jefferson.......	246 17
184...	Pierrepont Manor-Ellisburg........	Ellisburg.........................	Jefferson.......	346 71
185...	State road.........................	Lorraine..........................	Jefferson.......	11 50
71...	Utica-Paris........................	New Hartford....................	Oneida..........	1,105 55
3...	Deerfield..........................	Deerfield.........................	Oneida..........	485 20
48...	West Lake.........................	Skaneateles......................	Onondaga......	237 18
76...	La Fayette........................	La Fayette.......................	Onondaga......	211 55
122...	East Lake.........................	Skaneateles......................	Onondaga......	71 40
49...	Fabius-Apulia, section 1...........	Fabius...........................	Onondaga......	572 76
75...	Fabius-Apulia, section 2	Fabius...........................	Onondaga......	261 60
......	Residency Office..................	....	Onondaga......	2,100 00
	Total............................	....	....	$11,366 87

North Salina Street Bridge, Syracuse.

Chapter 686, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
D. C. Wedgeworth......	Assistant engineer..............	$6 00 per day	$42 00	....	$42 00
L. D. Brownell.........	Assistant engineer..............	6 00 per day	24 00	....	24 00

		$66 00
Incidental Expenses.		
Miscellaneous..	$592 20	592 20
Total..		$658 20

Brasher Falls Dam — St. Regis River.

Chapter 230, Laws of 1906; Chapter 686, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
David R. Lee...........	Assistant engineer..............	$6 00 per day	$246 00	$5 30	$251 30

		$251 30
Incidental Expenses.		
Postage...	$0 40	
Miscellaneous..	55	95
Total..		$252 25

Surveys for State Court of Claims.

Chapter 700, Laws of 1905; Chapter 686, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Guy Moulton	Resident engineer	$2,400 per year	$114 29	$3 50	$117 79
D. E. Whitford	Assistant engineer	5 00 per day	845 00	....	845 00
L. D. Brownell	Assistant engineer	5 00 per day	731 00	320 81	1,051 81
Wm. W. Cronin	Assistant engineer	5 00 per day	45 00	....	45 00
Fred J. Wagner	Assistant engineer	6 00 per day	24 00	13 60	37 60
R. V. Collins	Leveler	4 50 per day	396 00	....	396 00
E. J. Berry	Leveler	5 00 per day	55 00	9 33	64 33
C. H. Mattison	Inspector	3 50 per day	3 50	35	3 85
R. C. Pugh	Chainman	2 50 per day	7 50	....	7 50
Don A. Wilcox	Laborer	2 00 per day	160 00	....	160 00
B. A. Redington	Laborer	2 00 per day	66 00	....	66 00
J. H. Mullaley	Laborer	2 00 per day	60 00	....	60 00
J. L. Ames	Laborer	2 00 per day	8 00	....	8 00
J. G. Wynkoop	Laborer	2 00 per day	2 00	....	2 00
					$2,864 88

Incidental Expenses.

Livery	$44 45	
Stationery and printing	45	
Postage	54	
Telephone and telegraph	1 00	
Miscellaneous	96 30	
		142 74
Total		$3,007 62

SUMMARY.

The foregoing tables are summarized as follows:

Ordinary Repairs to Canals.

1.	Erie canal, chapter 683, Laws of 1906	$8,898 07
2.	Oswego canal, chapter 683, Laws of 1906	11 50
3.	Cayuga and Seneca canal, chapter 683, Laws of 1906	58 43
4.	Black River canal, chapter 683, Laws of 1906	32 00

Construction of Barge Canal.

5.	Construction of Barge canal, Erie canal, chapter 147, Laws of 1903	68,472 95
6.	Construction of Barge canal, Oswego canal, chapter 147, Laws of 1903	19,523 57

Improvement of Public Highways.

7.	Improvement of public highways, chapter 115, Laws of 1898; chapter 468, Laws of 1906	113,708 81
8.	Maintenance and repairs of improved public highways, chapter 115, Laws of 1898; chapter 468, Laws of 1906; chapter 686, Laws of 1906	11,366 87

Special Work.

9.	North Salina street bridge, Syracuse, chapter 686, Laws of 1906	658 20
10.	Brasher Falls dam, St. Regis river, chapter 729, Laws of 1904; chapter 700, Laws of 1905; chapter 230, Laws of 1906; chapter 686, Laws of 1906	252 25

Special Surveys.

11.	Surveys for State Court of Claims, chapter 700, Laws of 1905; chapter 686, Laws of 1906	3,007 62
	Total	$225,990 27

TABLE OF CONTRACTS COMPLETED ON THE MIDDLE DIVISION DURING THE FISCAL YEAR ENDING SEPTEMBER 30, 1907.

CONTRACTOR.	Date of contract.	Character of work.	ACT.		Appropriation.	Contract price.	Final payment.
			Chap.	Year.			
B. P. Clark	Aug. 22, 1906	Constructing a new apron and repairing State dam at Brasher Falls	729 700 230 686	1904 1905 1906 1906	$5,510 03	$5,038 25	$4,737 66
H. W. Fisher	June 13, 1907	Constructing a vertical retaining wall on the Oneida feeder, Oneida	686	1906	4,500 00	4,114 77	3,992 55

TABLE OF CONTRACTS COMPLETED ON THE MIDDLE DIVISION DURING THE FISCAL YEAR ENDING SEPTEMBER 30, 1907 — (Continued).

Improvement of Public Highways.

Chapter 115, Laws of 1898, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Contract price.	Final payment.
County of Broome	June 16, 1904	Endicott road, No. 174, Broome county	$19,900 00	$20,638 20
J. Francis Ward	Aug. 1, 1906	Additional work, State road, No. 185, Jefferson county	1,215 00	1,215 00
County of Broome	June 16, 1904	Center Village road, No. 211, Broome county	4,749 00	4,486 84
County of Broome	June 16, 1904	Ouaquaga road, No. 212, Broome county	8,249 00	8,007 92
County of Broome	June 16, 1904	River road, Windsor (section 2), No. 213, Broome county	22,999 00	28,221 39
County of Broome	June 16, 1904	River road, Windsor (section 1), No. 214, Broome county	12,794 00	14,023 44
Douglas V. Ashley	July 13, 1904	Guilford road, No. 225, Chenango county	41,348 00	42,604 72
Brennan & O'Brien	July 9, 1906	Sacketts Harbor road, No. 237, Jefferson county	10,887 00	11,212 62
County of Broome	July 12, 1906	Bridge road, No. 268, Broome county	9,053 68	9,724 43
Casey & Murray	July 10, 1906	Mohawk River road, Deerfield, No. 297, Oneida county	31,450 00	38,199 17
The Barnett Contracting Co.	Sept. 18, 1906	Minetto road, No. 370, Oswego county	6,170 00	6,054 48
Charles H. Quereau	July 10, 1906	Cincinnatus road, No. 377, Cortland county	3,650 00	3,614 41
Celestin C. Burns	July 7, 1906	Watertown-Carthage (section 2) road, No. 427, Jefferson county	37,256 00	38,018 85
J. Charles Dayton	July 20, 1906	Jordan Valley (section 1) road, No. 430, Onondaga county	13,797 00	13,916 37
Douglas V. Ashley	July 10, 1906	Cortland-Groton (section 1) road, No. 446, Cortland county	9,782 00	9,634 68
J. Francis Ward	Aug. 1, 1906	Repair contract No. 4, Road No. 147, Jefferson county	2,500 00	2,502 05

TABLE OF CONTRACTS PENDING ON THE MIDDLE DIVISION, SEPTEMBER 30, 1907.

CONTRACTOR.	Date of contract.	Character of work.	ACT.		Appropriation.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
			Chapter.	Year.				
National Construction Co. .	Nov. 1, 1906	Constructing stairways for the lift bridge at Catharine street, Syracuse.	683	1906	$1,500 00	$1,065 50	$1,500 00	. . . .
John M. Schultz.	Jan. 15, 1907	Constructing a lift bridge over the Oswego canal at North Salina street, Syracuse.	668	1906	*75,000 00	62,621 00	65,686 00	. . . .

* $31,250 appropriated by city of Syracuse and $12,500 by Syracuse Rapid Transit Railway.

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Empire Engineering Corporation.	April 18, 1905	Contract No. 4, Erie canal.	$812,560 00	$726,815 00	$148,572 00
Empire Engineering Corporation.	April 18, 1905	Contract No. 5, Erie canal.	421,252 50	381,987 50	104,679 00
The Groton Bridge Co.	Aug. 10, 1906	Contract No. 7, bridges on sections 5 and 7, Erie canal.	39,883 30	38,125 80	. . . .

TABLE OF CONTRACTS PENDING ON THE MIDDLE DIVISION, SEPTEMBER 30, 1907 — (Continued).

Construction of Barge Canal — (Continued).

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Mosier & Summers	June 7, 1906	Contract No. 10, Oswego canal	$1,149,988 00	$1,126,718 00	$64,107 00
Stewart-Kerbaugh-Shanley Co	Sept. 23, 1907	Contract No. 12, Erie canal	3,082,560 00	3,391,716 00	....
Gilmour-Horton-Allen Co	Sept. 16, 1907	Contract No. 35, Oswego canal	752,760 00	739,261 00	....

Improvement of Public Highways.

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
John Weber & Sons, Inc	Dec. 31, 1906	Cortland-Homer road, No. 208, Cortland county	$8,600 00	$7,545 00	$543 24
Celestin C. Burns	July 7, 1906	Adams-Henderson (section 2) road, No. 234, Jefferson county	49,950 00	45,176 00	24,422 62
Celestin C. Burns	July 7, 1906	Watertown-Sacketts Harbor-Henderson (section 2) road, No. 235, Jefferson county	15,180 00	13,962 00	15,411 55
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Redwood-Alexandria Bay (section 2) road, No. 236, Jefferson county	38,200 00	35,467 20	....
Celestin C. Burns	July 7, 1906	Henderson Harbor road, No. 238, Jefferson county	30,450 00	27,858 00	20,070 49
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Coleman Hill (section 1) road, No. 245, Onondaga county	15,600 00	14,716 45	....

TABLE OF CONTRACTS PENDING ON THE MIDDLE DIVISION, SEPTEMBER 30, 1907 — (Continued).

Improvement of Public Highways — (*Continued*).

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Casey & Murray	July 10, 1906	Utica-Oneida Castle (section 1) road, No. 250, Oneida county	$144,100 00	$133,050 00	$122,208 56
County of Broome	July 12, 1906	Deposit road, No. 265, Broome county	30,000 00	26,474 70	16,917 34
County of Broome	July 12, 1906	Tunnel road, No. 266, Broome county	13,750 00	13,319 00	4,195 49
County of Broome	July 12, 1906	Castle Creek road, No. 267, Broome county	54,750 00	54,662 70	42,308 93
Casey & Murray	Sept. 15, 1906	Utica-Oneida Castle (section 2) road, No. 271, Oneida county	86,500 00	79,800 00	11,673 90
County of Broome	July 12, 1906	Gulf Bridge (section 1) road, No. 274, Broome county	15,250 00	14,406 28	11,928 40
County of Broome	July 12, 1906	Union-Maine road, No. 275, Broome county	31,500 00	30,604 00	6,059 59
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Syracuse-Watertown road, No. 278, Oswego county	26,950 00	23,475 80	....
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	West Oswego River road, No. 279, Oswego county	27,800 00	25,423 35	....
The Barnett Contracting Co	Sept. 18, 1906	Oswego-Sterling road, No. 280, Oswego county	13,550 00	12,700 00	12,970 80
Wm. J. Dwyer	Aug. 31, 1906	South Salina street road, No. 290, Onondaga county	13,900 00	12,200 00	8,564 40
Chas. H. Quereau	July 10, 1906	West Lake (section 2) road, No. 292, Onondaga county	10,550 00	9,350 00	....
Chas. H. Quereau	July 10, 1906	East Lake (section 2) road, No. 293, Onondaga county	9,500 00	8,750 00	2,992 50
Casey & Murray	July 10, 1906	Mohawk River road, Floyd, No. 295, Oneida county	29,750 00	26,750 00	18,812 70
Casey & Murray	July 10, 1906	Mohawk River road, Marcy, No. 296, Oneida county	49,200 00	43,250 00	43,530 30
H. C. Schroeder	Sept. 18, 1907	Reservation road, Fayette, No. 320, Seneca county	50,500 00	45,743 15	....
Wm. J. Dwyer	Aug. 31, 1906	Valley road, Marcellus, No. 328, Onondaga county	19,500 00	17,300 00	778 50
Chas. H. Quereau	Nov. 23, 1906	Valley road, Camillus, No. 329, Onondaga county	34,400 00	30,250 00	13,884 75
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Skaneateles-Hamilton turnpike (section 1) road, No. 330, Onondaga county	28,500 00	27,093 00	....
County of Tompkins	Aug. 30, 1906	Cayuga Heights road, No. 336, Tompkins county	37,400 00	33,182 00	4,180 93
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Syracuse turnpike road, No. 337, Madison county	13,800 00	12,525 30	....
County of Tompkins	Aug. 30, 1906	Catskill turnpike (section 2) road, No. 338, Tompkins county	14,900 00	13,111 00	4,247 96

TABLE OF CONTRACTS PENDING ON THE MIDDLE DIVISION, SEPTEMBER 30, 1907 — (Continued).

Improvement of Public Highways — (*Concluded*).

Chapter 115, laws of 1898; Chapter 468, Laws of 1906.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Wm. I. Tyler	Sept. 18, 1906	Georgetown road, No. 339, Madison county	$31,400 00	$27,487 50	$4,452 98
Wm. J. Dwyer	July 9, 1906	Collamer road, No. 348, Onondaga county	20,400 00	18,000 00	17,834 41
John H. Gordon	Nov. 23, 1906	Augusta road, Augusta, No. 368, Oneida county.	36,000 00	34,500 00	2,794 50
John H. Gordon	Aug. 29, 1906	Augusta road, Oriskany Falls, No. 369, Oneida county	30,600 00	28,000 00	23,431 75
County of Broome	July 12, 1906	Maine road, No. 374, Broome county	33,550 00	32,902 60	1,184 49
County of Broome	July 12, 1906	Barker road, No. 375, Broome county	6,550 00	6,290 50	4,868 85
John Weber & Sons, Inc	July 10, 1906	McGrawville road, No. 378, Cortland county	30,750 00	26,661 00	22,075 31
John Weber & Sons, Inc	Sept. 19, 1906	Harford road, No. 379, Cortland county	7,600 00	6,868 00	....
Mott & Kemper	Nov. 14, 1906	State road, Homer, No. 380, Cortland county	42,400 00	37,300 00	7,775 10
Stewart-Kerbaugh-Shanley Co	Sept 20, 1907	State road, Scott, No. 381, Cortland county	27,300 00	26,475 75	....
Brayer Brothers	July 10, 1906	Owasco road, No. 383, Cayuga county	21,500 00	18,000 00	15,228 00
The Scofield Co	Nov. 10, 1906	Fleming road, No. 384, Cayuga county	31,960 00	28,250 00	6,610 50
Allyn G. Bridge	Nov. 27, 1906	Augusta road, Vernon Center, No. 406, Oneida county	38,900 00	34,759 75	26,089 38
County of Broome	July 12, 1906	Vestal road, No. 420, Broome county	35,600 00	35,287 18	....
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Watertown-Theresa (section 3) road, No. 423, Jefferson county	40,350 00	37,169 85	....
Frederick Williams	Nov. 16, 1906	Belleville-Adams (section 1) road, No. 424, Jefferson county	11,900 00	11,000 00	9,603 00
Wm. J. Semper	July 3, 1906	Adams-Watertown (section 2) road, No. 425, Jefferson county	26,100 00	24,000 00	10,152 00
Wm. J. Dwyer	July 9, 1906	Thompson road, No. 429, Onondaga county	25,700 00	22,700 00	16,548 30
J. Charles Dayton	July 20, 1906	Skaneateles-Spafford road, No. 431, Onondaga county	27,700 00	25,997 00	10,996 73
M. F. Dollard	Aug. 29, 1906	Augusta road (Lowell and Spencer sections), No. 438, Oneida county	70,500 00	66,666 00	48,180 91
Stewart-Kerbaugh-Shanley Co	Sept.20, 1907	Phœnix-Pennellville road, No. 450, Oswego county	21,550 00	18,787 50	....
Wm. J. Dwyer	July 9, 1906	Cicero-South Bay road, No. 452, Onondaga county	33,100 00	28,937 95	....
County of Tompkins	Aug. 30, 1906	Ithaca road, No. 454, Tompkins county	37,900 00	33,238 75	26,624 24
County of Tompkins	Aug. 30, 1906	Wyckoff road, No. 455, Tompkins county	4,500 00	3,851 25	....
County of Tompkins	Aug. 30, 1906	Catskill turnpike (section 3) road, No. 483, Tompkins county	44,400 00	35,655 25	2,246 28

John Young	Nov. 10, 1906	Skaneateles–West Lake (sections 3, 4 and 5) road, No. 486, Onondaga county	37,000 00	31,994 00	17,852 65
Daniel V. Brown	Nov. 10, 1906	Elbridge road, No. 487, Onondaga county	44,300 00	36,487 00	3,612 21
Daniel V. Brown	Nov. 10, 1906	Norwich–North Norwich road, No. 505, Chenango county	45,848 00	37,769 00	25,591 16
Wm. I. Tyler	July 6, 1906	Chittenango–Eagle Village road, No. 506, Madison county	21,700 00	19,000 00	15,732 00
Mott & Kemper	July 6, 1906	Oswego–Mexico (section 1) road, No. 509, Oswego county	50,000 00	44,700 00	39,827 70
John Weber & Sons, Inc	July 10, 1906	Homer–Tully (section 1) road, No. 510, Cortland county	29,366 00	25,770 00	1,623 51
Stewart–Kerbaugh–Shanley Co	Sept. 20, 1907	Massena–Waddington (sections 1, 2, 3 and 4) road, No. 521, St. Lawrence county	61,800 00	59,660 00	....
Stewart–Kerbaugh–Shanley Co	Sept. 20, 1907	Cortland–Dryden (section 2) road, No. 535, Cortland county	21,750 00	20,019 60	....
Casey & Murray	Sept. 17, 1907	Utica–Bridgewater road, No. 559, Oneida county	81,000 00	76,347 00	....
Casey & Murray	Sept. 17, 1907	Mohawk River road, Rome, No. 560, Oneida county	24,600 00	23,406 70	....
The Scofield Co	Nov. 10, 1906	Auburn–Seneca Falls (section 1) road, No. 590, Cayuga county	76,900 00	69,660 00	13,792 68
Jeremiah T. Finch	Nov. 15, 1906	Moravia–Niles road, No. 591, Cayuga county	89,800 00	82,392 00	22,245 84
Chambers & Grady	Sept. 18, 1906	Auburn–Elbridge road, No. 592, Cayuga county	55,400 00	47,000 00	24,111 00
Stewart–Kerbaugh–Shanley Co	Sept. 20, 1907	Norwich–South New Berlin (section 1) road, No. 596, Chenango county	35,900 00	32,988 50	....
Stewart–Kerbaugh–Shanley Co	Sept. 20, 1907	Cayuga Heights–Hanshaw's Corners road, No. 606, Tompkins county	25,000 00	21,511 75	....
Stewart–Kerbaugh–Shanley Co	Sept. 20, 1907	Auburn–Owasco road, No. 614, Cayuga county	59,000 00	54,662 15	....
Stewart–Kerbaugh–Shanley Co	Sept. 20, 1907	Trumansburg–Ithaca road, No. 616, Tompkins county	94,500 00	88,439 60	....

TABLE OF CONTRACTS PENDING ON THE MIDDLE DIVISION, SEPTEMBER 30, 1907 — (Concluded).

Maintenance and Repairs of Improved Public Highways.

Chapter 468, Laws of 1906; Chapter 686, Laws of 1906.

CONTRACTOR.	Date of Contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
County of Broome	July 26, 1906	Repair contract No. 6—Roads Nos. 125 and 127, Broome county	$5,200 00	$4,794 50	$3,744 72
Joseph H. Conners	July 17, 1907	Repair contract No. 22—Roads Nos. 3 and 71, Oneida county	7,340 00	8,162 50	689 17
Joseph H. Conners	July 17, 1907	Repair contract No. 23—Road No. 147, Jefferson county	3,077 50	3,637 50	2,648 25
Douglas V. Ashley	July 19, 1907	Repair contract No. 24—Road No. 224, Chenango county	6,200 00	6,932 50	4,398 30
Joseph H. Conners	July 17, 1907	Repair contract No. 25—Roads Nos. 49 and 121, Onondaga county	8,562 50	10,825 00	6,693 66

WATER RECORDS OF CAYUGA AND CROSS LAKES AND SENECA RIVER.

(See State Engineer's Report for 1905 for records from 1884 to 1905, inclusive)

LOCATION.	1906. DECEMBER 8 AND 9. WATER.		1907. MARCH 8 AND 9. WATER.		1907. AUGUST 8 AND 9. WATER.		Remarks.
	Surface.	Depth.	Surface.	Depth.	Surface.	Depth.	
Cayuga lake	— 8.508	10.6	....	......	— 8.758	10.3	Depth on lower miter-sill.
Mud lock	— 8.654	10.4	— 9.454	9.5	— 9.234	9.8	Depth on lower miter-sill.
Canandaigua river, south of canal	—10.200	6.0	—10.720	5.5	—13.780	2.6	Depth of river.
Seneca river aqueduct	—10.401	6.5	—10.869	6.1	—13.951	3.0	Depth on aqueduct foundation.
Canandaigua river, north of canal	—10.576	6.0	—10.986	5.4	—14.066	2.5	Depth of river.
West Shore railroad crossing	—10.779	5.4	—11.219	4.8	—14.199	2.0	Depth in channel.
N. Y. C. & H. R. R. R. crossing	—11.176	5.2	—11.426	5.0	—14.415	2.0	Depth on bridge foundation.
Mosquito Point	—13.106	5.0	—13.846	4.2	—16.315	1.7	Depth in channel.
Cross lake	—13.887	20.5	—14.387	19.6	—16.725	17.0	Depth at iron bridge.

REPORT

OF THE

DIVISION ENGINEER

OF THE

WESTERN DIVISION

For the Fiscal Year Ending September 30, 1907.

WESTERN DIVISION.

State of New York,
Department of State Engineer and Surveyor,
Western Division.

Rochester, N. Y., *October* 1, 1907.

Hon. Frederick Skene, *State Engineer and Surveyor, Albany, N. Y.:*

Sir.— I have the honor of submitting to you the annual report for the Western Division, for the year ending September 30, 1907.

The extent of the Erie canal on this division has not been changed during the past year.

Assistance has been furnished the Department of Public Works in the line of surveys for blue line and surveys for abandonment of property.

Investigations and reports have been made on legislative bills which have been referred to this division.

Under the direction of Mr. M. W. Wilbur, First Resident Engineer, surveys have been made and data collected for use of the Attorney-General in the defense of suits before the Court of Claims.

BARGE CANAL.

(Chapter 147, Laws of 1903.)

Work was continued at the various residencies and under the respective resident engineers, as follows:

Lyons Residency, No. 8. From the west line of the town of Savannah to the west line of Wayne county, with office at Lyons, N. Y., under F. P. Williams, Resident Engineer, from September 30, 1906, to March 1, 1907, and under B. E. Failing, Resident Engineer, from March 1 to September 30, 1907.

Rochester Residency No. 9. From the west line of Wayne county to the west line of Monroe county, under the direction of T. J. Morrison, First Assistant Engineer.

Medina Residency, No. 10–A. From the west line of Monroe county to 100 feet east of Gasport bridge, No. 151, with office at Medina, under D. D. Waldo, Resident Engineer, from September 30, 1906, to May 1, 1907, and from May 1 to September 30, 1907, under George T. Keith, Resident Engineer.

Lockport Residency, No. 10–B. From 100 feet east of Gasport bridge, No. 151, to the head of Sulphur Springs guard-lock, with office at North Tonawanda, under T. W. Barrally, from September 30, 1906, to March 1, 1907; under M. B. Palmer, Resident Engineer, from March 1 to May 1, 1907, and from May 1 to September 30, 1907, this residency was again in charge of T. W. Barrally, Resident Engineer.

Tonawanda Residency, No. 11. From the head of Sulphur Springs guard-lock to Buffalo harbor, with office at North Tonawanda, N. Y. This residency has been under the charge of the same Resident Engineers as Residency No. 10–B.

ERIE CANAL, RESIDENCY NO. 8.

Mr. B. E. Failing reports the following work done on this residency:

Office. Plans, profiles and estimates have been made for all alternate schemes from Fox Ridge to Macedon. The comparison of the 1900 line and the low level line resulted in the adoption of the latter. The law adopting the line south of Savannah by May's Point was passed by the last Legislature.

The 100-foot scale mounted maps on the residency have been laid out; also the 1900 and 1905 topography; about 50 per cent of the cross-sections and all the borings to date have been plotted and inked on these maps. About 12 per cent of the cross-sections on the residency have been plotted on cross-section paper.

Field. The proposed center line has been run from the Seneca county line to Clyde, and from Lyons to the west end of the residency it is about 79 per cent finished. Center line cross-sections have been taken from the Seneca county line to Clyde, and from Lyons to Macedon they are about 72 per cent finished. Borings have been made between Lyons and Newark. About 20 per cent of the borings on the residency are finished.

ERIE CANAL, RESIDENCY No. 9.

The report of work done on this residency under T. J. Morrison follows, with the execption of the work done under Contract No. 6, which has not been under his direction:

The surveys for Contract No. 23, from King's Bend to the Genesee river, made during the preceding year, were supplemented by additional surveys by a party under Lewis G. Fisher, Assistant Engineer. Two hundred feet of additional borings were also taken on this section. Samples showing the character of the soil were taken, labeled and packed, and the results of the borings tabulated and sent to Albany.

Additional surveys and rock soundings in the vicinity of the Johnson and Seymour dam, near Court street, Rochester, were made and the results plotted and sent to Albany.

The work of running out the blue lines on Contract No. 60, from the west end of Contract No. 6 to Station 3470, near Adams Basin, was completed by a party under H. J. Hemstreet, Assistant Engineer. Gas-pipe monuments were set at all angle points in the blue lines. A new center line was located at South Greece, which materially reduces the curvature at this point and does away with the necessity of rebuilding Findley's bridge, No. 93. All the necessary cross-sections, topography and borings for this line have been taken and plotted. All the preliminary maps, cross-sections, borings, etc., for this contract have been plotted and checked, including the layout plans for structures. The contract drawings and estimates have been about 80 per cent completed.

On Contract No. 61, from Station 3470 to the Monroe-Orleans county line, the blue lines were run out by Mr. Hemstreet's party and gas-pipe monuments set at angle points as far west as Station 3574. Some additional rock soundings, necessary to fill out the cross-sections, were taken and plotted on the cross-section sheets, with the exception of the layout plans of structures. Practically no work was done on the plans of this contract during the year, the office force being mainly engaged on Contracts Nos. 23 and 60.

The survey line from the west end of Contract No. 6 to the Monroe-Orleans county line was monumented by a party under Mr. Fisher. These monuments are made of concrete, 3½ feet deep and 6 inches in diameter, set at every angle point in the survey line. A copper pin, 8 inches long and ¼ inch in diameter, embedded in the concrete, fixes the angle point. On the top of the monument small figures, denoting the station of the point, were imprinted before the concrete had set.

Daily readings have been taken of the two gauges on the Genesee river; one on the West Shore R. R. bridge and the other on Elmwood avenue bridge, Rochester.

Besides the work of the residency proper, the office force has taken care of any Division work that was necessary. This included furnishing Albany and the several residency offices with tracings of plans of structures and copies of records on file in the Division office; the preparation of appropriation maps for Contract No. 6 and the checking of monthly estimates of Contracts Nos. 6, 7, and 19.

Progress of Work on Residency No. 9. *Length, approximately* 39.70 *miles.*

From Wayne county line to King's Bend, approximately 12.28 miles.

(1) Field work — None, except check levels.
(2) Office work — None.

Contract No. 23, King's Bend to Genesee river, 5.62 miles long.

(1) Field work, preliminary —All done.
(2) Field work, appropriation surveys — None.
(3) Office work, preliminary maps —All done.
(4) Office work, contract plans, etc.— None.

Contract No. 21, Genesee river to contract No. 6, 2.58 miles long.

(1) Field work, preliminary —All done.
(2) Field work, appropriation surveys — None.
(3) Office work, preliminary maps —All done.
(4) Office work, contract plans, etc.—All done, except bridges, locks and river work.

Contract No. 6, 3.28 miles long. Under construction.

Contract No. 60, from Contract No. 6 to Adams Basin waste-weir, 8.53 miles long.

(1) Field work, preliminary —All done.
(2) Field work, appropriation surveys — None.
(3) Office work, preliminary maps —All done.
(4) Office work, contract plans, etc.— 80 per cent done.

Contract No. 61, Adams Basin waste-weir to Monroe-Orleans county line, 7.41 miles long.

(1) Field work, preliminary —All done.
(2) Field work, appropriation surveys — None.
(3) Office work, preliminary maps and surveys — 60 per cent done.
(4) Office work, contract plans, etc.— None.

Contract No. 6 *and Part of Contract No.* 7.

This work was in charge of George T. Keith, Resident Engineer, from September 30, 1906, to March 1, 1907, and from March 1, to September 30, 1907, has been under the direction of R. J. Marcher, Resident Engineer, who reports the following:

Contract No. 6 extends from a point just west of Rochester, Station 2571, to a point near South Greece, Station 2744, a distance of 3.28 miles.

All preliminary surveys and plans on this section are completed and all necessary rights of way appropriated, except three parcels — one from Maple street west, on the north side of the canal, one adjoining this to the west, and one parcel west of the Falls Branch of the N. Y. C railroad and north of the canal, this piece being needed for spoil banks to facilitate the work of excavating at Buffalo road and N. Y. C. railroad crossing west.

Four small extra parcels of rights of way have been secured this year, two from George W. Payne and two from the George Richardson estate, both at Station 2730, to accommodate the change of raising the approaches of Spier's road bridge and to secure necessary ditching along the side of the approaches.

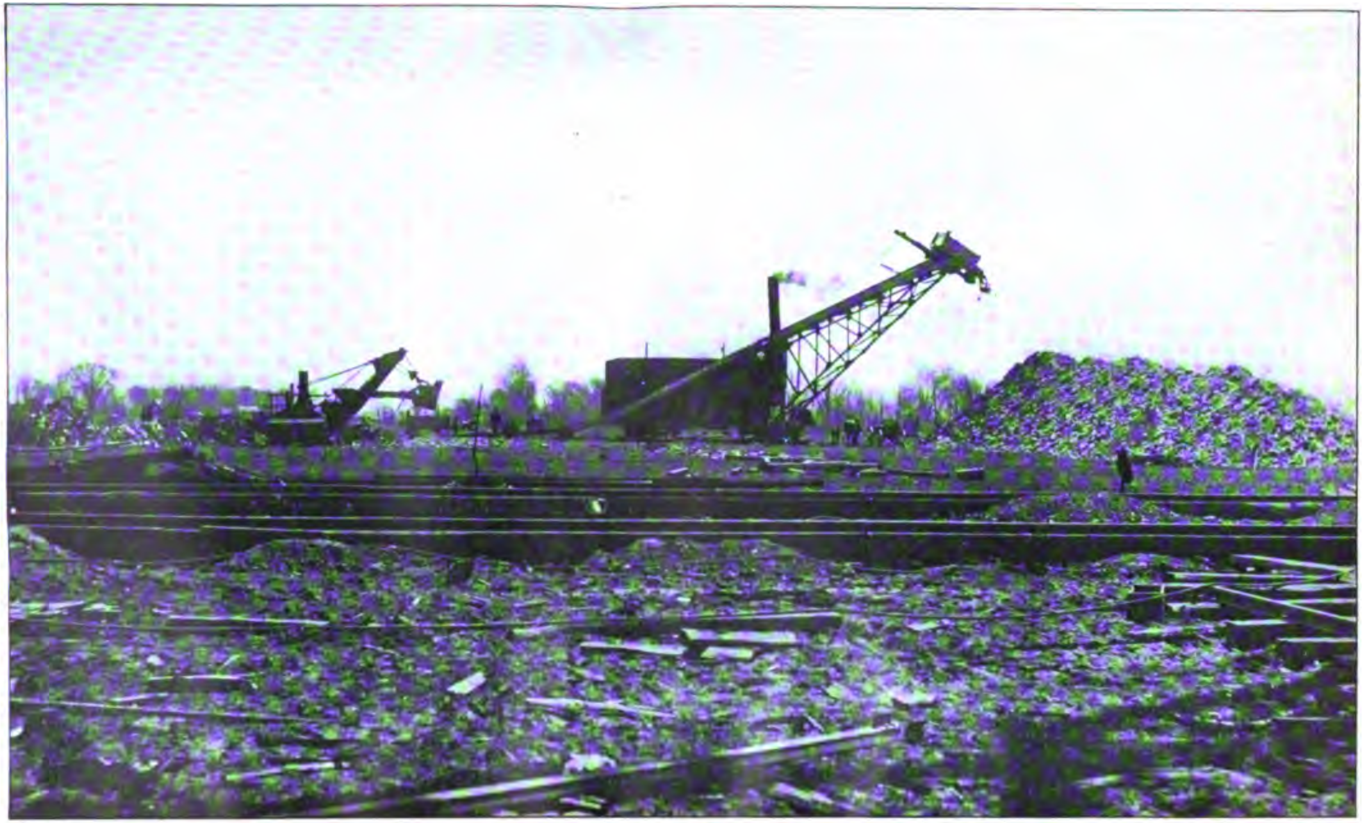
The main portion of the excavation has been prosecuted at two points this year, one working east from the west end of the section, through solid rock to Station 2687, for the full width of the prism and down to grade, and from Station 2687 to Station 2670 more than one-half of the excavation has been taken out. All this work for the year has been in about 35 feet of cutting and has been executed by means of a Grab machine, steam shovels and drills. The other part of the excavation has been from Station 2630 to Station 2578, removing earth, boulders and loose strata of rock down to bed rock for the full width of prism and half way down to grade, the average cut to grade being about 30 feet. This work was executed by an incline and tipple machine, as a conveyor, together with a steam shovel excavator. The composite nature of this material, together with excess of water, has delayed work here considerably. A new incline and tipple is in process of erection, to excavate between Stations 2550 and 2630.

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing, ...acres	27	5.4	21.6	20	80
Grubbing, ...cu. yds.	4,500	0.0	3,711.4	0	82
All excavation, ...cu. yds.	1,990,000	322,649.0	868,092.0	16	44
Channeling, ...sq. ft.	440,000	0.0	0.0	0	0
Forming embankment, ...cu. yds.	30,000	1,365.0	22,596.0	5	75
Puddle, ...cu. yds.	1,700	0.0	0.0	0	0
White oak timber and plank, ft. B. M.	500	0.0	0.0	0	0
Hemlock timber and plank, ft. B. M.	500	0.0	0.0	0	0
Second-class concrete, ...cu. yds.	2,700	234.2	234.2	9	9
Third-class concrete, ...cu. yds.	300	264.6	264.6	9	9
First-class masonry coping, cu. yds.	15	2.0	2.0	13	13
Wash wall, including coping, cu. yds.	9,000	0.0	0.0	0	0
Stone paving, ...sq. yds.	60	0.0	0.0	0	0
Fencing, ...lin. ft.	800	0.0	0.0	0	0
Macadam paving, ...sq. yds.	500	0.0	0.0	0	0

Total of all work done during the year = 16.5 per cent of estimated cost.
Total of all work done to date = 42.1 per cent of estimated cost.

Contract No. 7. This part of Contract No. 7 provides for furnishing and erecting in place, steel highway bridge superstructures, at the following points on Contract No. 6:

Buffalo road bridge, Station 2576+14.
Lyell road bridge, Station 2631+38.
Lee road bridge, Station 2661+64.
Spier's road bridge, Station 2729+10.



BARGE CANAL, CONTRACT NO. 6.

View showing the work of excavating the prism by means of a steam-shovel and conveying the excavated material to the spoil bank back from the side of the channel by an incline and tipple.

Spier's road concrete abutments, together with the superstructure, have been completed and the approaches made safe for public travel; also the abutments and superstructure for the N. Y. C. railroad crossing have been completed under "Special Agreement Alteration No. 2," dated December 20, 1906. The excavation on this bridge consists of 2840 cubic yards, and the concrete in the same work consists of 312 cubic yards of second-class concrete, which excavation and concrete were originally a part of Contract No. 6.

The construction of the bridge abutments at Lee road, Lyell avenue and Buffalo road has been deferred until the rock excavation has been completed at these points, as the heavy blasting would in all probability permanently injure the concrete. The Lee road and Buffalo road are still intact and the Lyell road crossing will be put in good shape for the coming winter.

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Structural steel in place, ...lbs.	530,000	118,002	118,002	22	22
Yellow pine or Douglass fir lumber, ...ft. B. M	47,000	10,139	10,139	22	22
Setting stone coping, ...cu. yds.	11.9	2	2	17	17
Lining, ...cu. yds.	12	3	3	25	25

Total of all work done during year = 6 per cent of estimated cost.
Total of all work done to date = 6 per cent of estimated cost.

ERIE CANAL, RESIDENCY NO. 10–A.

The report of work done on this residency follows:

This residency is divided into 5 contracts. The work done on each is as follows:

Contract No. 62, Station 3855+63, Monroe county line, to Station 4233+29, near Hindsburg, 6.15 miles.

FIELD WORK.

(1) Repainted references to base line monuments.

OFFICE WORK.

(1) Finished plotting preliminary mounted maps.
(2) Located trial center line on mounted maps.
(3) Computed center line.
(4) Plotted and traced layout plans at bridges.

Contract No. 63, Station 4233+29, near Hindsburg, to Station 4603, near Eagle Harbor, 7.00 miles.

FIELD WORK.

(1) Finished monumenting base line.
(2) Repainted references to base line monuments.

OFFICE WORK.

(1) Finished plotting preliminary mounted maps.
(2) Located trial center line on mounted maps.
(3) Computed center line.
(4) Plotted layout plans at bridges.
(5) Plotted layout plans at culverts.

Contract No. 9, Station 4603, near Eagle Harbor, to Station 4903, near Medina, 5.68 miles.

FIELD WORK.

(1) Finished monumenting base line.
(2) Painted references to base line monuments.
(3) Measured buildings to be appropriated.

OFFICE WORK.

(1) Finished replotting and inking cross-sections.
(2) Prepared index maps, contract No. 9.
(3) Prepared list of buildings and land to be appropriated.
(4) Replotted new appropriation lines, contract No. 9.

Contract No. 64, Station 4903, near Medina, to Station 5222, near Middleport, 6.04 miles.

FIELD WORK.

(1) Finished monumenting base line.
(2) Repainted references to base line monuments.
(3) Measured buildings to be appropriated.
(4) Base line run around " Loop " in Medina.

OFFICE WORK.

(1) Finished plotting preliminary mounted maps.
(2) Made revised contract plans and estimate.
(3) Prepared index maps, contract No. 64.
(4) Prepared lists of land and buildings to be appropriated.
(5) Replotted appropriation lines and spoil banks.

Contract No. 65, Station 5222, near Middleport, to Station 5529+18, near Gasport, 5.81 miles.

FIELD WORK.

(1) Finished monumenting base line.
(2) Repainted references to base line monuments.

OFFICE WORK.

(1) Finished plotting preliminary mounted maps.
(2) Finished plotting layout maps at bridges.
(3) Finished plotting layout maps at culverts.
(4) Preparation of contract maps and estimate, 90 per cent finished.
(5) Searched title of land to be appropriated.

ERIE CANAL, RESIDENCY 10–B.

Report of Residency 10–B, under T. W. Barrally, follows:

Residency No. 10–B includes that part of section 10, between Gasport bridge and the head of the guard-lock at Sulphur Springs. This residency was divided into three contracts, as follows:

Contract No. 66, Gasport bridge, Station 5529+18, to foot of locks at Lockport, Station 5865+00.

All preliminary work on this contract has been finished during the year and the drawings sent to the Division office at Rochester.

Contract No. 67, Station 5865 to Station 5896, in the city of Lockport.

All preliminary work, including additional surveys, borings and maps at Lockport locks, have been completed during the year and information sent to Albany.

Contract No. 40, Station 5896 to the head of guard-lock at Sulphur Springs.

Work was held up on this contract pending a decision in regard to the width of prism in the long rock cut west of Lockport and a harbor location. This having been decided, work is now proceeding on preparation of contract drawings and estimates.

At the present time, therefore, all preliminary work in residency No. 10–B is completed, except the contract tracings and estimates of contract No. 40.

ERIE CANAL, RESIDENCY NO. 11.

Mr. T. W. Barrally, Resident Engineer in charge, reports the following work for the year:

All preliminary surveys, maps, borings, contract drawings and estimates were completed before the beginning of the year and the plans sent to Albany.

This residency is divided into two contracts, of which contract No. 19 extends from the head of the guard-lock, Station 6148, to the mouth of Ellicott creek, Station 6806, a distance of 12.46 miles.

Contract No. 19 was awarded to the Great Lakes Construction Co., of Buffalo, N. Y., on November 26, 1906, and actual work was started May 22, 1907. During the present year no work has been undertaken except dredging and the excavation of dry cuts on cut-off lines. The present plant, installed, includes one dipper dredge, one small clam-shell dredge and one Ledgerwood cableway plant of 600-feet span.

No successful method has been devised for excavating material from the Tonawanda creek and depositing it in spoil banks, without a second handling, and at present operations are largely confined to work on one of the land cuts and to the rehandling of dredged materials on a cableway.

Much of the present season has been lost in the installation of the plant, so that the full plant has been in operation but a little over two months. That either a much larger equipment and plant, or a different style of plant and methods of operation will be required, is apparent by an examination of the following summary, which gives the percentage of work done to date:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
All excavation, from Guard-lock to Station 6180..........cu. yds.	240,000	16,743	16,743	7	7
All excavation from Station 6180 to Tonawanda............cu. yds.	2,842,000	57,913	57,913	2	2

Total of all work done during year = 2 per cent of estimated cost.
Total of all work done to date = 2 per cent of estimated cost.

IMPROVEMENT OF PUBLIC HIGHWAYS.

(Chapter 115, Laws of 1898; chapter 468, Laws of 1906, and chapter 170, Laws of 1907.)

The climatic conditions of the winter of 1906–7 were such as to cause a great deal of damage to the roads constructed under the Higbie–Armstrong law. The sudden changes in the spring caused the roads to heave, by the action of the frost, and the sharp-shod heavy horses picked up the surface and caused the roads to ravel. The automobile traffic also contributed to the general wear of the roads by the weight of the machines used and the speed maintained. Even on roads newly constructed, subject to a heavy automobile traffic, the wearing course will stay on the surface but a short time, as the speed maintained by the machines over the roads lifts the screenings from the surface, allowing them to blow away or work to the edges of the macadam, leaving the road bare, and the traffic is then directly on the macadam, without a cushion or wearing coat, and this allows the surface to pick up and ravel in dry seasons and in a short time ruts and depressions appear.

The amount of money available for repairs was entirely inadequate to place the roads in a good condition. The money was expended as far as possible on the roads which were in greatest need of attention, but it was not enough to put all roads in good condition.

The contract which Erie county had to maintain its roads was canceled and when the repairs were started by the State, it was found that the roads in the southern towns were practically worn out. To all appearances little, if anything, had been done under the contract in the way of repairs.

White's Corners road was repaired by recapping about 7,500 linear feet with limestone.

Aurora–Buffalo road (section 1) and Orchard Park road (sections 1, 2, 3 and 4) will have to be rebuilt, as they are rutted and full of holes. The traffic on all these roads is very heavy, both in tons and the number of vehicles and automobiles using them. The loads, both in and out of Buffalo, in tonnage, are from 3 to 5 tons and all drive in one track, rutting the roads.

even with trap-rock top, inside of two years' use. These roads had the worst places fixed with gravel or broken stone, except the Aurora–Buffalo road (section 1), upon which nothing was done, owing to lack of funds.

About the only road that will withstand this traffic is a brick pavement. It is a common sight to see loads of fertilizer being drawn over these roads from Buffalo by two horses and being met by an extra team where the improved road ends, going on over the unimproved road with four horses instead of two. The market wagons into Buffalo, with from 1½ to 3 tons, all travel in one rut and in trains of from 4 to 20 teams following one another.

Main Street road (section 1) was recapped with limestone and treated with "Tarvia," which seems to wear well, lay the dust and give a permanent wearing coat. How this treatment will withstand the weather remains to be seen.

No work was done on Main Street roads (sections 2, 3 and 4), Transit roads (sections 1 and 2), River roads (sections 1, 2 and 3) or Big Tree road. The last-named road is in very bad condition and will have to be recapped and have the holes repaired with cobble telford and cobble drains put in on the hills and worst places.

Main Street roads (sections 1, 2, 3 and 4) and River roads (sections 1, 2 and 3) should have the ruts and depressions repaired and a wearing surface put on.

In Monroe county East Avenue road was recapped for 1.4 miles, leaving one mile that requires recapping. This was finished late in the fall of 1906. Dugway road (section 1) was also repaired in 1906, as were the West Henrietta, Scottsville (section 1), Dugway (section 2) and Monroe Avenue roads.

Ridge road (section 1) was recapped for 8,900 feet, leaving 5 miles to recap.

Some repairs on Hamlin road (sections 1 and 2), Clifton road and Lake road (section 1) were also made.

Repairs were made this summer on West Henrietta road, Scottsville (section 2), Clifton (section 1), Buffalo (section 2), Monroe avenue, Penfield (sections 1 and 2), East Avenue, Hilton (sections 1 and 2) and Lake road (section 1). A new culvert was built on Hudson Avenue road (section 1). The repairs consisted in putting on cobble telford, cobble blind drains, recapping, clearing ditches and culverts and scraping wings.

The money available was expended before the work was completed, leaving several roads, which were badly in need of repairs, without any work being done on them.

All the roads in Ontario county were put in good condition, excepting the Bristol Valley (section 1), which is rutted, and the repairs started could not be finished on account of lack of funds. The repairs consisted in recapping, putting in cobble telford and cobble blind drains, cleaning ditches and culverts and in scraping wings.

The worst places in the roads in Chemung county were repaired in the fall of 1906, but as the roads have been in use for several years, with a large amount of traffic on narrow tires, which leaves the roads badly worn, they should be recapped the coming summer, to put them in good condition.

The construction has progressed, with three or four exceptions, as well as could be expected or asked of the contractors, considering the rainy falls of 1906 and 1907.

Something should be done in regard to keeping narrow-tired wagons off the roads constructed under the State Aid Act, as it has been demonstrated, ever since the State has constructed these roads, that they will not stand narrow-tired traffic, with heavy loads, all traveling — as they do — in one track; also the speed of motor vehicles should be limited.

Survey parties were working all last winter on petitions in the various counties on the Division and plans have been revised and prepared, as far as called for, by the boards of supervisors of the several counties.

Contracts were let for the "Further Improvement" of the following roads, all the work under these contracts being completed in the late fall of 1906:

Gorham–Stanley road, No. 203–A, 2.197 miles long. Contract awarded to John Johnson, September 19, 1906, for $804.50.

Honeoye–Hemlock road, No. 191–A, 4.549 miles long. Contract let to Mosier and Summers, July 17, 1906, for $912.

East Side–Lake road (*section* 1), *No.* 190–A, 2.368 miles long. Contract let to John Johnson, September 19, 1906, for $500.

Bristol Valley road, No. 188–A, 4.83 miles long. Contract let to John Johnson, September 19, 1906, for $153.

Penfield road (section 1), *No.* 166–A, 3.635 miles long. Contract let to the Pittsford Construction Co. for $148.25.

Penfield road (section 2), *No.* 167–A, 5.313 miles long. Contract let to the Pittsford Construction Co. for $1,022.55.

The following repair contracts were also let, all work being completed in the fall of 1906:

Contract No. 12, let to the Grand Avenue Horse Company, August 9, 1906. This contract covered Dugway road (section 1), No. 168, 3.30 miles long, and Dugway road (section 3), No. 170, 2.88 miles long, the contract prices for them being $9,569 and $466, respectively.

Contract No. 11, let to the Pittsford Construction Co., August 14, 1906. This contract covered the repair of the following roads:

East Avenue road, No. 5, 2.45 miles long, $11,817.
Fairport road, No. 60, 3.039 miles long, $1,440.
Pittsford road, No. 61, 1.304 miles long, $285.
Monroe Avenue road, No. 94, 4.226 miles long, $2,249.

A detailed account of the work on the roads under contract during the fiscal year follows:

CONTRACTS COMPLETED DURING THE YEAR ENDING SEPTEMBER 30, 1907.

REED'S CORNERS ROAD, NO. 206, ONTARIO COUNTY.

Length, 2.67 miles.
Width of macadam, 12 feet.
Engineer's preliminary estimate of total cost, including engineering, $21,000.
Contract dated, July 10, 1906.
Work commenced, August 6, 1906.
Work completed, July 27, 1907.
Final account, $19,375.07.
Contractor, John Johnson.
Engineers in charge, John F. Clancey and Chas. F. Swain.

This improvement extends southerly from its junction with the Geneva–Canandaigua road, in the towns of Hopewell and Gorham, and was built of local granite laid in three courses, excepting one-half mile, which was laid in two courses — a 4-inch bottom and a 3-inch top.

GRISWOLD STREET ROAD, NO. 251, NIAGARA COUNTY.

Length, 3.15 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $18,400.

Contract dated, July 5, 1906.

Work commenced, July 12, 1906.

Work completed, October 27, 1906.

Final account, $17,507.23.

Contractors, Mosier and Summers.

Engineer in charge, Edwin M. Secrist.

This improvement extends from the Telegraph road southerly, in the town of Royalton, and was built in two equal courses, three inches thick when rolled, of local limestone crushed along the road.

CLIFTON (SECTION 2) ROAD, NO. 252, MONROE COUNTY.

Length, 2.92 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $22,200.

Contract dated, July 11, 1906.

Work commenced, July 30, 1906.

Work completed, May 29, 1907.

Final account, $19,810.85.

Contractor, Frederick A. Brotsch.

Engineer in charge, George G. Miller.

This improvement extends from the village of Chili westerly to Buckbees Corners, in the town of Chili, and was built with a 3-inch bottom of local stone and a 3-inch top of local limestone from Akron. About one mile of this road had the bottom thickness increased to six inches.

LITTLE RIDGE (SECTION 4) ROAD, NO. 257, MONROE COUNTY.

Length, 3.36 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $28,100.

Contract dated, July 11, 1906.

Work commenced, April 15, 1907.

Work completed, August 17, 1907.

Final account, $23,844.80.

Contractor, Monroe Roads Company.

Engineer in charge, F. W. Bristow.

This road was originally let to Mr. Frederick A. Brotsch, but was assigned to the Monroe Roads Company, April 13, 1907. As originally planned it was to be built in three courses, but under date of May 9, 1907, a supplementary agreement was entered into, whereby the road was constructed with a 4-inch bottom of local stone and a 3-inch top of granite.

This improvement extends from the west line of the town of Parma westerly to the village of Clarkson, in the town of Clarkson.

ORCHARD PARK (SECTION 5) ROAD, NO. 272, ERIE COUNTY.

Length, 1.21 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $13,700.

Contract dated, July 10, 1906.

Work commenced, July 11, 1906.

Work completed, December 6, 1906.

Final account, $12,784.21.

Contractor, John Johnson.

Engineers in charge, C. H. Fosdick and Harry D. Waldo.

This improvement extends from the village of Orchard Park to the village of Duels Corners, in the town of East Hamburg, and was built of limestone from the Barber Asphalt Co., of Buffalo.

BARNARDS CROSSING (SECTIONS 1 AND 2) ROAD, NO. 276, MONROE COUNTY.

Length, 4.14 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $39,400.

Contract dated, July 13, 1906.

Work commenced, August 13, 1906.

Work completed, July 27, 1907.

Final account, $36,235.25.

Contractor, Greece Construction Co.

Engineer in charge, George G. Miller.

This improvement extends from the northern line of the city of Rochester northerly to the Latta road, in the town of Greece. The bottom course consists of local stone and the top course of limestone from Le Roy.

GENEVA–CANANDAIGUA (SECTION 3) ROAD, NO. 333, ONTARIO COUNTY.

Length, 1.09 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $9,400.

Contract dated, July 10, 1906.

Work commenced, August 6, 1906.

Work completed, November 15, 1906.

Final account, $8,497.65.

Contractor, Henry C. Schroeder.

Engineer in charge, Arthur S. Whitbeck.

This improvement extends from the west line of the town of Geneva to the west line of the city of Geneva, in the town of Geneva, and was constructed entirely of Le Roy limestone. This completes a line of improved highway from Canandaigua through to Geneva. Two thousand four hundred and eighteen linear feet of this road was constructed with a 6-inch bottom.

LYONS–GENEVA ROAD, NO. 334, ONTARIO COUNTY.

Length, 1.69 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $15,716.

Contract dated, July 10, 1906.

Work commenced, September 24, 1906.

Work completed, August 24, 1907.

Final account, $13,594.05.

Contractor, Henry C. Schroeder.

Engineer in charge, Arthur S. Whitbeck.

This improvement extends from the north line of the city of Geneva northerly to the cross-roads in the towns of Geneva and Phelps, and was constructed of Le Roy limestone.

VICTOR–MENDON (SECTION 1) ROAD, NO. 335, ONTARIO COUNTY.

Length, 5.20 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $42,800.

Contract dated, July 5, 1906.

Work commenced, August 6, 1906.

Work completed, August 24, 1907.

Final account, $37,866.17.

Contractors, Mosier and Summers.

Engineer in charge, Jos. W. Howe.

This improvement extends from the east line of the town of Victor to the west line of Ontario county, except through the village of Victor, in the town of Victor. This road was built with a local stone base and a limestone top.

GRAND CENTRAL AVENUE ROAD, NO. 357, CHEMUNG COUNTY.

Length, 1.57 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $16,400.

Contract dated, September 13, 1906.

Work commenced, April 15, 1907.

Work completed, August 31, 1907.

Final account, $14,425.30.

Contractors, Costello and Neagle.

Engineer in charge, John Philo Kelley.

This improvement extends from the city of Elmira to Elmira Heights and from Elmira Heights to the village of Horseheads, in the town of Horseheads. The road was built with a limestone base and a trap-rock top.

DANSVILLE–MT. MORRIS (SECTION 3) ROAD, NO. 482, LIVINGSTON COUNTY.

Length, 2.23 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $25,000.

Contract dated, July 11, 1906.

Work commenced, July 23, 1906.

Work completed, August 31, 1907.

Final account, $24,089.59.

Contractors, McCarthy and Simerson.

Engineer in charge, B. E. Moses.

This road extends from the west line of the town of Groveland northwesterly to the village of Mt. Morris, in the town of Mt. Morris, and was built with a bottom course partially of Le Roy and Portage Falls stone and with a top course of Le Roy limestone.

CANANDAIGUA–VICTOR ROAD, NO. 484, ONTARIO COUNTY.

Length, 6.79 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $51,000.

Contract dated, July 9, 1906.

Work commenced, July 18, 1906.

Work completed, August 31, 1907.

Final account, $44,787.41.

Contractors, Chambers and Grady.

Engineers in charge, Chas. A. Carruth and Chas. M. Edwards.

This improvement extends from the north line of the village of Canandaigua northwesterly to the east line of the town of Victor, in the towns of Canandaigua and Farmington, and was built of limestone from a local quarry at Hathaways.

CLARENCE–HUNT'S CORNERS ROAD, No. 522, ERIE COUNTY.

Length, 4.75 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $41,000.

Contract dated, June 30, 1906.

Work commenced, July 20, 1906.

Work completed, August 21, 1907.

Final account, $35,659.62.

Contractor, Fred Knickenberg.

Engineer in charge, Harry D. Waldo.

This improvement extends from the Main Street road, at Clarence northerly to Mansfields Corners, in the town of Clarence, and was built throughout with limestone from quarries at Akron and Clarence.

CONTRACTS PENDING SEPTEMBER 30, 1907.

LYELL ROAD, No. 253, MONROE COUNTY.

Length, 2.12 miles.

Width of macadam, 16 and 20 feet.

Engineer's preliminary estimate of total cost, including engineering, $22,000.

Contract dated, July 11, 1906.

Work commenced, April 24, 1907.

Work completed, 90 per cent.

Contractor, Frederick A. Brotsch.

Engineer in charge, George G. Miller.

This improvement extends from the western boundary of the city of Rochester westerly to the Spencerport road, in the town of Gates, and will be built of local limestone laid in two equal courses, each three inches thick when rolled.

On December 12, 1906, a permit was granted to the Buffalo, Lockport and Rochester Railway Co. to lay a double track for electric railway purposes in this road.

CHILI (SECTION 1) ROAD, NO. 254, MONROE COUNTY.

Length, 3.11 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $27,700.

Contract dated, July 11, 1906.

Work not started.

Contractor, Frederick A. Brotsch.

This improvement extends from the western boundary of the city of Rochester southwesterly to the line between the towns of Gates and Chili, in the town of Gates.

The plans contemplate building this road in two equal courses of limestone, each three inches thick when rolled.

CHILI (SECTION 2) ROAD, NO. 255, MONROE COUNTY.

Length, 2.56 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $26,000.

Contract dated, July 11, 1906.

Work not started.

Contractor, Frederick A. Brotsch.

This improvement extends from the southern line of the town of Gates southwesterly to the village of Chili, in the town of Chili, and will be built of two equal courses of limestone, each three inches thick when rolled.

LITTLE RIDGE (SECTION 3) ROAD, NO. 256, MONROE COUNTY.

Length, 3.60 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $28,800.

Contract dated, July 13, 1906.

Work commenced, June 22, 1907.

Work completed, 86 per cent.

Contractor, Greece Construction Company.

Engineer in charge, Frank W. Bristow.

This improvement extends from the Spencerport–Hilton road westerly to the west line of the town of Parma, and was originally planned to be built as a three-course road; however, under date of May 8, 1907, a supplementary agreement was entered into whereby this road is to be built in two courses, the bottom course to be four inches thick, of local stone, and the top course three inches thick, when rolled, of local granite.

AURORA–BUFFALO (SECTION 2) ROAD, NO. 263, ERIE COUNTY.

Length, 4.23 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $42,400.

Contract dated, July 18, 1906.

Work commenced, April 14, 1907.

Work completed, 54 per cent.

Contractor, Gantz–Wilson Construction Co.

Engineer in charge, John S. Clancey.

This improvement extends from the eastern line of the town of West Seneca to the northern line of the town of Aurora, in the town of Elma. This road is to be built with a limestone, or local stone base and limestone top.

AURORA–BUFFALO (SECTION 3) ROAD, NO. 264, ERIE COUNTY.

Length, 0.74 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $6,900.

Contract dated, July 10, 1906.

Work commenced, May 22, 1907.

Work completed, 82 per cent.

Contractor, County of Erie.

Engineer in charge, John S. Clancey.

This improvement extends from the southern line of the town of Elma to the village of East Aurora, in the town of Aurora, and is being built with a limestone base and a limestone top.

The construction of Roads Nos. 263 and 264 will complete an improved highway from Buffalo to East Aurora.

HILTON ROAD, NO. 269, MONROE COUNTY.

Length, 4.30 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $28,000.

Contract dated, July 11, 1906.

Work commenced, April 13, 1907.

Work completed, 93 per cent.

Contractor, Frederick A. Brotsch.

Engineer in charge, F. W. Bristow.

This improvement extends from the Little Ridge road northerly to the village of Hilton, in the town of Parma. The road, as originally planned, contemplated a three-course road, but under date of September 10, a supplementary agreement was entered into, whereby this road is to be constructed with a 4-inch bottom of local stone and a 3-inch top of granite, without additional cost to the State.

LEFT FORK–GERMAN CHURCH–REDMAN ROAD, NO. 286, MONROE COUNTY.

Length, 5.55 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $40,300.

Contract dated, September 20, 1907.

Work not started.

Contractor, Stewart–Kerbaugh–Shanley Co.

This road extends from the Hamlin road northerly and westerly to the Cook road, in the town of Hamlin, and is to have a 4-inch local stone bottom and a 3-inch granite top.

CLOVER STREET (SECTION 1) ROAD, NO. 294, MONROE COUNTY.

Length, 5.89 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $44,900.

Contract dated September 17, 1907.

Work not started.

Contractor, Monroe Roads Co.

This road extends from Monroe avenue southerly to the southern line of the town of Pittsford, in the towns of Brighton and Pittsford. The bottom course is to be of four inches of local stone, with a 3-inch granite top.

ERIN–HORSEHEADS ROAD, NO. 356, CHEMUNG COUNTY.

Length, 9.22 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $102,000.

Contract dated, July 7, 1906.

Work commenced, July 30, 1906.

Work completed, 95 per cent.

Contractors, Bovier and Rawlins.

Engineer in charge, John P. Kelly.

This road extends from the east line of the village of Horseheads easterly to Mills street, near the village of Erin, in the towns of Erin and Horseheads, and is being built entirely of limestone.

CLINTON STREET (SECTION 1) ROAD, NO. 371, ERIE COUNTY.

Length, 5.65 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $55,900.

Contract dated, July 18, 1906.

Work commenced, August 6, 1906.

Work completed, 45 per cent.

Contractor, Gantz–Wilson Construction Co.

Engineers in charge, W. T. Huber and John S. Clancy.

This improvement extends from the east line of the city of Buffalo easterly to the west line of the town of Elma, in the towns of Cheektowaga and West Seneca.

The original plans contemplated the construction of this road entirely of limestone, but under date of April 11, 1907, a supplemental agreement was entered into, providing for the substitution of brick pavement from Station 0+10 to Station 150+50 in place of the macadam originally planned. This change was made on account of the large amount of traffic on this road and the unstable foundation which was found when the road was started.

CLINTON STREET (SECTION 2) ROAD, NO. 372, ERIE COUNTY.

Length, 6.14 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $61,500.

Contract dated, July 18, 1906.

Work commenced, July 2, 1907.

Work completed, 12 per cent.

Contractor, Gantz-Wilson Construction Co.

Engineer in charge, John S. Clancy.

This improvement extends from the east line of the town of West Seneca easterly to the west line of the town of Marilla, in the town of Elma. This road is being built of limestone.

GOODRICH ROAD, NO. 373, ERIE COUNTY.

Length, 8.77 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $84,400.

Contract dated, July 9, 1906.

Work commenced, April 8, 1907.

Work completed, 27 per cent.

Contractor, Wm. E. Baldwin & Co.

Engineers in charge, H. J. Simmelink and Chas. A. Carruth.

This improvement extends from the Main Street road to Tonawanda creek, in the town of Clarence, and is to be built entirely of local limestone.

FIVE CORNERS-KUCKVILLE (SECTION 1) ROAD, NO. 386, ORLEANS COUNTY.

Length, 3.47 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $21,300.

Contract dated, August 31, 1906.

Work commenced, November 5, 1906.

Work completed, 96 per cent.

Contractor, Thomas Hucknall.

Engineer in charge, I. O. Cole.

This improvement extends from the Oak Orchard road at Five Corners northwesterly to the north line of the town of Gaines, in the town of Gaines, and will be entirely built of local stone.

FIVE CORNERS–KUCKVILLE (SECTION 2) ROAD, NO. 387, ORLEANS COUNTY.

Length, 5.80 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $41,500.

Contract dated, August 31, 1906.

Work commenced, April 9, 1907.

Work completed, 14 per cent.

Contractor, Thomas Hucknall.

Engineer in charge, I. O. Cole.

This improvement extends from the south line of the town of Carlton northerly to Johnson's creek, in the town of Carlton, and will be built of local stone throughout.

KENDALL CORNERS ROAD, NO. 388, ORLEANS COUNTY.

Length, 3.43 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $24,900.

Contract dated, July 9, 1906.

Work commenced, August 5, 1907.

Work completed, 37 per cent.

Contractors, Chambers and Grady.

Engineer in charge, I. O. Cole.

This improvement extends from the line between the towns of

Murray and Kendall northerly to the R. W. & O. R. R. crossing, in the town of Kendall.

This road was originally planned as a three-course road, but under date of May 8, 1907, a supplemental agreement was entered into, whereby the road is to be built with a 4-inch local stone bottom and a 3-inch granite top.

MAPLE RIDGE (SECTION 1) ROAD, NO. 389, ORLEANS COUNTY.

Length, 3.08 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $21,600.

Contract dated, September 27, 1907.

Work not started.

Contractor, Fred W. Knickenberg.

This road extends from the east line of the village of Medina to the east line of the town of Shelby, in the town of Shelby, and will be built with a 3-inch local stone bottom and a 3-inch limestone top.

MAPLE RIDGE (SECTION 2) ROAD, NO. 390, ORLEANS COUNTY.

Length, 2.8 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $19,000.

Contract dated, September 27, 1907.

Work not started.

Contractor, Fred W. Knickenberg.

This road extends from the west line of the village of Medina westerly to the line between the counties of Orleans and Niagara, in the town of Shelby, and will be built with a 3-inch local stone bottom and a 3-inch limestone top.

LATTA ROAD, NO. 399, MONROE COUNTY.

Length, 6.84 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $82,000.

Contract dated, September 19, 1907.

Work not started.

Contractor, Jeremiah T. Finch.

This road extends from the west line of the village of Charlotte westerly to the east line of the town of Parma, in the town of Greece, and will be built with a 5-inch slag, or local stone bottom and a 3-inch limestone top.

PORTLAND AVENUE (SECTION 2) ROAD, NO. 400, MONROE COUNTY.

Length, 0.93 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $7,800.

Contract dated, September 24, 1907.

Work not started.

Contractor, Henry Schroeder.

This road extends from the Ridge road northerly to Titus avenue in the town of Irondequoit, and will be constructed with a 3-inch local stone bottom and a 3-inch limestone top.

SUSPENSION BRIDGE–LEWISTON ROAD, NO. 475, NIAGARA COUNTY.

Length, 2.42 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $25,500.

Contract dated, September 8, 1906.

Work commenced, September 19, 1906.

Work completed, 91 per cent.

Contractor, The Good Roads Construction Co.

Engineer in charge, Wm. C. Perkins.

This improvement extends from the city line of Niagara Falls northerly to the R. W. & O. R. R. crossing, near the village line of Lewiston, and will be built of local limestone.

Under date of May 28, 1907, a supplemental agreement was entered into, whereby the thickness of the road metal was increased, by adding a 3-inch course of quarry chips and spalls, to be used as a subbase. This was done to meet the wishes of the board of supervisors of Niagara county.

TRANSIT (SECTION 3) ROAD, NO. 507, NIAGARA COUNTY.

Length, 4.68 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $48,000.

Contract dated, July 9, 1906.

Work commenced, August 6, 1906.

Work completed, 74 per cent.

Contractor, Wm. E. Baldwin & Co.

Engineer in charge, C. J. Bean.

This improvement extends from the south line of the city of Lockport southerly to Tonawanda creek, in the towns of Lockport and Pendleton, and is being built of Lockport limestone.

HAMBURG–NORTH COLLINS ROAD, NO. 523, ERIE COUNTY.

Length, 8.86 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $114,900.

Contract dated, July 9, 1906.

Work commenced, July 7, 1907.

Work completed, 3 per cent.

Contractor, Wm. E. Baldwin & Co.

Engineer in charge, H. J. Simmelink.

This improvement extends from the south line of the village of Hamburg southwesterly to the north line of the town of North Collins, in the towns of Hamburg and Eden, and is being built entirely of limestone.

NORTH COLLINS–LAWTON ROAD, NO. 524, ERIE COUNTY.

Length, 5.43 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $73,900.

Contract dated, September 17, 1907.

Work not started.

Contractors, Mosier and Summers.

This road extends from the south line of the town of Eden southerly to the north line of the town of Collins, in the town of North Collins, and will be built with a 5-inch limestone bottom and a 3-inch limestone top.

LAWTON–GOWANDA ROAD, NO. 525, ERIE COUNTY.

Length, 4 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $46,900.

Contract dated, September 20, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

This road extends from the south line of the town of North Collins southerly to the north line of the village of Gowanda, in the town of Collins, and is to be built with a 3-inch limestone bottom and a 3-inch limestone top.

COLLINS–MORTONS CORNERS (SECTION 1) ROAD, NO. 526, ERIE COUNTY.

Length, 4.01 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $37,300.

Contract dated, September 20, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

This road extends from its intersection with the Lawton–Gowanda road easterly to Collins Center, in the town of Collins, and is to be built with a 3-inch limestone bottom and a 3-inch limestone top.

HAMBURG–SPRINGVILLE (SECTION 1) ROAD, NO. 527, ERIE COUNTY.

Length, 9.47 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $87,500.

Contract dated, September 20, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

This road extends from the east line of the village of Hamburg southeasterly to the north line of the town of Concord, in the towns of Hamburg and Boston, and will be built with a 6-inch gravel bottom and a 3-inch limestone top.

HAMBURG–SPRINGVILLE (SECTION 2) ROAD, NO. 528, ERIE COUNTY.

Length, 7.34 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including Engineering, $66,500.

Contract dated, September 20, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

This road extends from the south line of the town of Boston southerly to the village of Springville, in the town of Concord, and is to be built with a 6-inch gravel bottom and a 3-inch limestone top.

ALDEN TOWN LINE AND CLINTON STREET–MARILLA ROAD, NO. 529, ERIE COUNTY.

Length, 3.55 and 2.47 miles.

Width of macadam, 12 and 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $49,000.

Contract dated, September 20, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

This road extends from the west line of the village of Alden westerly to the Town Line road, a distance of 3.55 miles, in the town of Alden, and from the east line of the town of Elma easterly and southerly to Marilla, a distance of 2.47 miles, in the town of Marilla. The road is to be built with a 3-inch limestone bottom and a 3-inch limestone top.

BASE LINE–GRAND ISLAND (SECTION 1) ROAD, NO. 530, ERIE COUNTY.

Length, 1.81 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $14,000.

Contract dated, September 20, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

This road extends from the Niagara river westerly and northerly to Warrendale, in the town of Grand Island, and is to be built with a 3-inch limestone bottom and a 3-inch limestone top.

EAST PEMBROKE–BATAVIA ROAD, NO. 586, GENESEE COUNTY.

Length, 5.58 miles.

Width of macadam, 16 feet.

Engineer's preliminary estimate of total cost, including engineering, $49,000.

Contract dated, June 30, 1906.

Work commenced, October 30, 1906.

Work completed, 40 per cent.

Contractor, Frederick W. Knickenberg.

Engineers in charge, George C. Andrews and C. H. Fosdick.

This improvement extends from the west village line of Batavia, westerly to the east line of the town of Pembroke, in the town of Batavia, and will be built entirely of limestone.

OLEAN–ALLEGANY (SECTIONS 1 AND 2) ROAD, NO. 601, CATTARAUGUS COUNTY.

Length, 2.31 and 0.78 miles.

Width of macadam, 16 and 20 feet.

Engineer's preliminary estimate of total cost, including engineering, $39,000.

Contract dated, September 24, 1907.

Work not started.

Contractor, Gantz–Wilson Construction Co.

This road extends from the junction of the five mile and nine mile roads, southeasterly to the west line of the town of Olean, a distance of 2.31 miles, in the town of Allegany, and from the east line of the town of Allegany easterly to the west line of the city of Olean, a distance of 0.78 mile, in the town of Olean. The bottom course of this road will be composed of 4 inches of gravel, when rolled in place, with a 4-inch limestone top.

LEWISTON–DICKERSONVILLE ROAD, NO. 617, NIAGARA COUNTY.

Length, 4.80 miles.

Width of macadam, 12 feet.

Engineer's preliminary estimate of total cost, including engineering, $35,000.

Contract dated, September 20, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

This road extends from the east line of the village of Lewiston easterly to Dickersonville (except through the Tuscarora Indian Reservation), in the town of Lewiston, and is to be built with a 3-inch limestone, or local stone bottom and a 3-inch limestone top.

MT. MORRIS–GENESEO ROAD, NO. 622, LIVINGSTON COUNTY.

Length, 5.20 miles.

Width of macadam, 14 feet.

Engineer's preliminary estimate of total cost, including engineering, $49,200.

Contract dated, September 20, 1907.

Work not started.

Contractor, Stewart-Kerbaugh-Shanley Co.

This road extends from the northeast line of the village of Mt. Morris northeasterly to the south line of the village of Geneseo, in the towns of Mt. Morris, Groveland and Geneseo. The road is to be built with a 3-inch limestone bottom and a 3-inch limestone top.

IMPROVEMENT OF PUBLIC HIGHWAYS.

Recapitulation of Work Done to September 30, 1907.

COUNTY.	Miles under contract during year ending Sept. 30, 1907.	Miles of plans and estimates completed prior to Sept. 30, 1906.	Miles of plans and estimates completed prior to Sept. 30, 1907.	Miles of plans and estimates completed during year ending Sept. 30, 1907.	Miles of surveys made during year ending Sept. 30, 1907.	Miles of contracts completed prior to Sept. 30, 1906.	Miles of contracts completed prior to Sept. 30, 1907.	Miles of contracts completed during year ending Sept. 30, 1907.
Allegany			6.87	6.87	6.87			
Cattaraugus	3.09	13.03	23.21	10.18	9.94			
Chautauqua		1.05	1.05					
Chemung	10.79	45.16	46.06	0.90	4.98	8.09	9.66	1.57
Erie	75.96	154.95	160.32	5.37	48.57	53.18	59.14	5.96
Genesee	5.58	5.58	24.62	19.04	15.00			
Livingston	7.43	31.33	37.20	5.87	9.95		2.23	2.23
Monroe	45.32	*243.36	*246.47	3.11	34.13	87.77	98.19	10.42
Niagara	15.05	15.05	33.35	18.80	44.33		3.15	3.15
Ontario	17.44	76.53	99.67	23.14	34.44	32.83	50.27	17.44
Orleans	18.56	*64.93	*66.51	1.58	1.40			
Schuyler								
Steuben		15 09	15.09					
Wayne		1.99	33.95	31.96	21.75			
Wyoming								
Yates		10.41	10.41					
Totals	199.22	678.46	804.78	126.32	231.36	181.87	222.64	40 77

*County line road, 5.55 miles long, appears in both counties.

I am indebted to Mr. M. W. Wilbur, First Resident Engineer, and the various Resident Engineers, both on road and canal work; also to the other employees of this division, for the conscientious manner in which they have performed their duties.

In closing, I desire to thank you and your Deputies for the consideration shown me.

Respectfully submitted,

JOHN P. KELLY,

Division Engineer.

THE FOLLOWING STATEMENTS SHOW THE NAMES, RANK AND COMPENSATION OF ENGINEERS EMPLOYED IN THE WESTERN DIVISION OF THE DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR, TOGETHER WITH INCIDENTAL EXPENSES, FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1907.

Ordinary Repairs to Canals — Erie Canal.

Chapter 683, Laws of 1906.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
A. J. Rockwood	Division engineer	$3,600 per year	$918 38	$30 11	$978 49
John P. Kelly	Division engineer	3,600 per year	2,651 62	32 19	2,683 81
M. W. Wilbur	First resident engineer	2,700 per year	882 75	11 27	894 02
H J. Hemstreet	Assistant engineer	6 00 per day	48 00		48 00
E. P. Strowger	Leveler	5 00 per day	80 00		80 00
J. B. Barrett	Leveler	5 00 per day	1,185 00		1,185 00
E. A. Bonney	Draughtsman	4 50 per day	9 00		9 00
A. B. Chappell	Draughtsman	4 00 per day	20 00		20 00
B. E. Moses	Rodman	4 00 per day	8 00		8 00
R. T. Webster	Inspector	4 50 per day	225 00	3 40	228 40
L. A. MacSweeney	Inspector	3 50 per day		5 21	5 21
C. G. Harger, Jr	Financial clerk	5 00 per day	140 00		140 00
John T. Maher	Financial clerk	5 00 per day	155 00	15 06	170 06
A. B. Williams	Estimate clerk	4 50 per day	40 50		40 50
Anna M. Lorscheider	Stenographer	1,000 per year	999 96		999 96
Henry Engler	Laborer	2 00 per day	24 00		24 00
L. A. MacSweeney	Laborer	2 00 per day	50 00		50 00
Theobald M. Quinn	Laborer	2 00 per day	22 00		22 00
Fred'k Freemesser	Laborer	2 00 per day	104 00		104 00
George W. Rogers	Laborer	2 00 per day	26 00		26 00
					$7,716 45
Incidental Expenses.					
Stationery and printing				$85 54	
Postage				67 11	
Office rent				400 00	
Telephone and telegraph				147 62	
Miscellaneous				472 78	
					1,173 05
Total					$8,889 50

Construction of Barge Canal — Erie Canal.

Chapter 147, Laws of 1903.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
A. J. Rockwood	Division engineer	$3,600 per year		$17 47	$17 47
John P. Kelly	Division engineer	3,600 per year		205 47	205 47
D. D. Waldo	Resident engineer	2,400 per year	$1,074 72	34 30	1,109 02
Geo. T. Keith	Resident engineer	2,400 per year	1,730 75	73 79	1,804 54
M. B. Palmer	Resident engineer	2,400 per year	400 00	35 26	435 26
R. J. Marcher	Resident engineer	2,400 per year	1,200 00	28 17	1,228 17
F. P. Williams	Resident engineer	2,400 per year	1,000 00	75 79	1,075 79
B. E. Falling	Resident engineer	2,400 per year	1,400 00	75 86	1,475 86
T. W. Barrally	Resident engineer	2,400 per year	2,000 00	136 61	2,136 61
C. J. McDonough	First assistant engineer	7 00 per day	966 00	120 02	1,086 02
T. J. Morrison	First assistant engineer	7 00 per day	1,078 00	24 47	1,102 47
H. J. Hemstreet	Assistant engineer	6 00 per day	1,818 00	42 04	1,860 04
Lewis G. Fisher	Assistant engineer	5 00 per day	291 00	4 64	295 64
Lewis G. Fisher	Assistant engineer	6 00 per day	1,560 00	36 88	1,596 88
Chas. A. Ingersoll	Assistant engineer	6 00 per day	1,728 00	41 84	1,769 84
John H. Huber	Assistant engineer	5 00 per day	530 00	9 99	539 99
John H. Huber	Assistant engineer	6 00 per day	1,092 00	4 07	1,096 07
Edward Anderberg	Assistant engineer	5 00 per day	530 00	154 33	684 33
Edward Anderberg	Assistant engineer	6 00 per day	732 00	145 15	877 15
Frank T. Marsh	Assistant engineer	6 00 per day	1,674 00	23 02	1,697 02
Chas. A. Pohl	Assistant engineer	6 00 per day	1,434 00	2 80	1,436 80
Arthur S. Whitbeck	Assistant engineer	6 00 per day	618 00		618 00
G. G. Underhill	Assistant engineer	6 00 per day	162 00		162 00
J. Seward Summers	Assistant engineer	5 00 per day	455 00		455 00
Hall Gleason	Assistant engineer	5 00 per day	520 00	161 63	681 63
Geo. C. Mills	Assistant engineer	5 00 per day	120 00	8 42	128 42
Elmer C. Lawton	Assistant engineer	5 00 per day	395 00	93 98	488 98
F. J. Wilbur	Assistant engineer	5 00 per day	285 00	7 33	292 33
M. S. Smith	Assistant engineer	5 00 per day	30 00		30 00
W. G. Harger	Assistant engineer	5 00 per day	15 00		15 00
R. H. Merrill	Assistant engineer	5 00 per day	65 00	24 04	89 04
C. A. Hartnagle	Assistant geologist			14 36	14 36
C. G. Harger	Financial clerk	5 00 per day	175 00		175 00
John T. Maher	Financial clerk	5 00 per day	495 00	14 96	509 96
A. B. Williams	Estimate clerk	4 50 per day	711 00		711 00
Frank V. Searls	Estimate clerk	4 00 per day	1,156 00		1,156 00
Melvin D. Casler	Leveler	5 00 per day	190 00	55 14	245 14
Hall Gleason	Leveler	4 50 per day	670 50	15 40	685 90
Elias H. Anderson	Leveler	4 50 per day	594 00	13 90	607 90
A. S. Millinowski	Leveler	4 50 per day	112 50		112 50
J. Seward Summers	Draughtsman	5 00 per day	849 00		849 00
Chas. R. Zorsch	Draughtsman	4 50 per day	333 00		333 00
Edward A. Zorsch	Draughtsman	4 50 per day	1,284 50		1,284 50
Edward H. Bourne	Draughtsman	4 50 per day	108 00		108 00
Edward H. Bourne	Draughtsman	5 00 per day	1,305 00		1,305 00
Chas. A. Carruth	Draughtsman	4 50 per day	252 00		252 00
N. Clyde Roe	Draughtsman	4 00 per day	628 00		628 00
A. B. Chappell	Draughtsman	4 00 per day	596 00	12 78	608 78
C. S. Allen	Tracer	75 00 per month	149 40		149 40
R. T. Webster	Inspector	4 50 per day	535 50	22 27	557 77
L. A. MacSweeney	Inspector	3 50 per day	52 50		52 50
L. A. MacSweeney	Inspector	4 50 per day	67 50		67 50
John A. Harold	Inspector	3 50 per day	98 00		98 00
Geo. W. Rogers	Inspector	3 50 per day	63 00	11 35	74 35
R. T. Webster	Rodman	4 00 per day	52 00		52 00
Walter G. Dubey	Rodman	4 00 per day	1,072 00	25 35	1,097 [illegible]
C. J. Bean	Rodman	4 00 per day	412 00		412 00
Geo. C. Andrews	Rodman	4 00 per day	392 00		392 00
Harry N. Haight	Rodman	3 50 per day	94 50	28 42	122 92
Harry N. Haight	Rodman	4 00 per day	661 00	28 78	[illegible] 78
Elias H. Anderson	Rodman	3 50 per day	94 50		94 50
Elias H. Anderson	Rodman	4 00 per day	516 00		516 00
A. S. Millinowski	Rodman	3 50 per day	189 00	5 21	194 21
J. F. Scanlon	Rodman	3 50 per day	108 50	16 48	124 98
A. B. Chappell	Chainman	3 00 per day	453 00		453 00
E. J. Greiner	Chainman	3 00 per day	807 00	57 68	864 68
T. W. Gerstner	Chainman	3 00 per day	237 00		237 00
G. Latta Barrus	Chainman	2 50 per day	622 50	54 07	676 57
James M. Wilson	Chainman	2 50 per day	377 50	57 38	434 88
Fred. C. Facer	Chainman	2 50 per day	302 50	52 32	354 82
F. L. Swift	Boatman	3 00 per day	471 00	162 98	633 98
A. E. Weinholtz	Boatman	3 00 per day	459 00		459 00
Wm. S. McGrath	Boatman	3 00 per day	540 00		540 00

Construction of Barge Canal — Erie Canal — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
D. S. Hollenbeck	Boatman	$3 00 per day	$843 00		$843 00
Fred. H. Palmer	Foreman of borings	3 50 per day	220 50	$20 24	240 74
John J. McManus	Foreman of borings	3 50 per day	112 50	5 71	118 21
L. M. Waldner	Laborer	2 00 per day	360 00		360 00
Frank Conroy	Laborer	2 00 per day	166 00		166 00
Frank McMahon	Laborer	2 00 per day	324 00		324 00
Peter D. Giaraffy	Laborer	2 00 per day	132 00		132 00
Albert Murphy	Laborer	2 00 per day	28 00		28 00
Fred. W. Drake	Laborer	2 00 per day	54 00		54 00
E. R. Maynard	Laborer	2 00 per day	102 00		102 00
Fred. Freemesser	Laborer	2 00 per day	130 00		130 00
George Davis	Laborer	2 00 per day	386 00		386 00
Edward P. Boyle	Laborer	2 00 per day	386 00		386 00
Marcus Shafer, Jr	Laborer	2 00 per day	100 00		100 00
Michael Unger	Laborer	2 00 per day	278 00		278 00
Edwin B. Male	Laborer	2 00 per day	278 00		278 00
John J. Sullivan	Laborer	2 00 per day	242 00		242 00
George F. Poinan	Laborer	2 00 per day	164 00		164 00
Frank R. Bemish	Laborer	2 00 per day	158 00		158 00
C. B. Nye	Laborer	2 00 per day	278 00		278 00
L. M. Heyendorfer	Laborer	2 00 per day	224 00		224 00
Theophilus Beaupre	Laborer	2 00 per day	224 00		224 00
Arthur B. Eddy	Laborer	2 00 per day	224 00		224 00
Harry Marshall	Laborer	2 00 per day	8 00		8 00
Wm. W. Smith	Laborer	2 00 per day	48 00		48 00
Wm. O. Bryan	Laborer	2 00 per day	48 00		48 00
Peter Allen	Laborer	2 00 per day	40 00		40 00
Harvey G. Eckler	Laborer	2 00 per day	168 00		168 00
Arthur E. Williams	Laborer	2 00 per day	10 00		10 00
Henry Engler	Laborer	2 00 per day	286 00		286 00
Jay Dixon	Laborer	2 00 per day	224 00		224 00
G. Latta Barrus	Laborer	2 00 per day	128 00		128 00
Christ. Kumro	Laborer	2 00 per day	224 00	53 21	277 21
Will. Frind	Laborer	2 00 per day	4 00		4 00
M. Martin	Laborer	2 00 per day	16 00		16 00
Lynn H. Barrows	Laborer	2 00 per day	260 00		260 00
Thomas Bushnell	Laborer	2 00 per day	254 00		254 00
W. H. Cook	Laborer	2 00 per day	34 00		34 00
Wm. J. Berdel	Laborer	2 00 per day	154 00		154 00
John E. Conway	Laborer	2 00 per day	90 00		90 00
Geo. W. Rogers	Laborer	2 00 per day	62 00	24 45	86 45
Frank J. Madden	Laborer	2 00 per day	176 00		176 00
Wm. H. Lines	Laborer	2 00 per day	122 00		122 00
Wm. Gorman	Laborer	2 00 per day	154 00		154 00
Edward J. Clancy	Laborer	2 00 per day	120 00		120 00
Paul Howe	Laborer	2 00 per day	104 00		104 00
Ralph B. Smith	Laborer	2 00 per day	132 00		132 00
Thomas Shannahan	Laborer	2 00 per day	124 00		124 00
Thomas F. Clifford	Laborer	2 00 per day	120 00		120 00
John Mockler	Laborer	2 00 per day	120 00		120 00
Herbert C. Snelgrove	Laborer	2 00 per day	158 00		168 00
Edward F. Lindsay	Laborer	2 00 per day	102 00		102 00
Jerome J. Brueckel	Laborer	2 00 per day	60 00		60 00
James J. Sullivan	Laborer	2 00 per day	34 00		34 00
Harold Richardson	Laborer	2 00 per day	108 00		108 00
Michael Cunningham	Laborer	2 00 per day	100 00		100 00
Frank O'Connor	Laborer	2 00 per day	100 00		100 00
John Healy	Laborer	2 00 per day	60 00		60 00
J. W. Seeley	Laborer	2 00 per day	24 00		24 00
Wm. J. Ward	Laborer	2 00 per day	16 00		16 00
F. H. Carroll	Laborer	2 00 per day	80 00		80 00
Louis J. Stauff	Laborer	2 00 per day	44 00		44 00
John Coughlin	Laborer	2 00 per day	76 00		76 00
Peter Arnold	Laborer	2 00 per day	64 00		64 00
Bernhardt Wende	Laborer	2 00 per day	100 00		100 00
Frank Harris	Laborer	2 00 per day	84 00		84 00
Francis A. O'Neil	Laborer	2 00 per day	98 00		98 00
Raymond T. Kelly	Laborer	2 00 per day	62 00		62 00
Walter V. Scott	Laborer	2 00 per day	44 00		44 00
R. J. Curran	Laborer	2 00 per day	30 00		30 00
Geo. H. Salisbury	Laborer	2 00 per day	12 00		12 00
Michael Gallagher	Laborer	2 00 per day	52 00		52 00
George Murphy	Laborer	2 00 per day	46 00		46 00
John C. Mitchell	Laborer	2 00 per day	38 00		38 00

Construction of Barge Canal — Erie Canal — (Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Jacob Snell, Jr	Gage reader	$6 00 per month	$66 00	....	$66 00
George Tuscher	Gage reader	5 00 per month	4 43	....	4 43
Wm. J. Swartz	Gage reader	5 00 per month	55 00	....	55 00
Wm. J. Swartz	Gage reader	12 00 per month	12 00	....	12 00
John F. Wickham	Gage reader	5 00 per month	60 00	....	60 00
Wm. Moran	Gage reader	5 00 per month	55 00	....	55 00
George E. Krill	Gage reader	5 00 per month	55 00	....	55 00
Carl Tuscher	Gage reader	5 00 per month	35 00	....	35 00
C. Henry Harrison	Gage reader	5 00 per month	31 13	....	31 13
					$56,142 15
		Incidental Expenses.			
Livery				$232 00	
Instruments, tools and appliances				270 82	
Office rent				1,360 50	
Fuel and light				141 50	
Stationery and printing				142 45	
Postage				133 91	
Telephone and telegraph				380 59	
Miscellaneous				2,375 84	
					5,037 61
Total					$61,179 76

Improvement of Public Highways.

Chapter 115, Laws of 1898, and amendatory laws.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
A. J. Rockwood	Division engineer	$3,600 per year	....	$115 70	$115 70
John P. Kelly	Division engineer	3,600 per year	....	457 64	457 64
M. W. Wilbur	First resident engineer	2,700 per year	$1,601 00	413 50	2,014 50
James E. Kelley	Resident engineer	2,400 per year	2,374 20	320 61	2,694 81
E. V. R. Payne	Resident engineer	2,400 per year	1,000 00	85 36	1,085 36
F. M. Williams	Resident engineer	2,400 per year	1,400 00	151 67	1,551 67
T. J. Morrison	First assistant engineer	7 00 per day	1,127 00	10 55	1,137 55
Chas. M. Edwards	First assistant engineer	7 00 per day	2,114 00	567 60	2,681 60
Frank W. Bristow	Assistant engineer	6 00 per day	1,800 00	18 60	1,818 60
Geo. G. Miller	Assistant engineer	6 00 per day	1,902 00	82 38	1,984 38
Frank T. Marsh	Assistant engineer	6 00 per day	186 00	....	186 00
Isaac O. Cole	Assistant engineer	6 00 per day	1,878 00	1,296 13	3,174 13
John H. Huber	Assistant engineer	6 00 per day	42 00	4 70	46 70
Wm. C. Perkins	Assistant engineer	6 00 per day	1,932 00	59 84	1,991 84
M. W. Williams	Assistant engineer	5 00 per day	325 00	340 56	665 56
M. S. Smith	Assistant engineer	5 00 per day	755 00	....	755 00
John Philo Kelley	Assistant engineer	5 00 per day	1,868 00	524 99	2,392 99
John S. Clancy	Assistant engineer	5 00 per day	1,961 00	635 54	2,599 54
Arthur S. Whitbeck	Assistant engineer	5 00 per day	1,207 00	76 10	1,283 10
J. Seward Summers	Assistant engineer	5 00 per day	65 00	21 65	86 65
W. G. Harger	Assistant engineer	5 00 per day	510 00	13 20	523 20
C. G. Harger, Jr	Financial clerk	5 00 per day	110 00	....	110 00
John T. Maher	Financial clerk	5 00 per day	470 00	20 95	490 95
A. B. Williams	Estimate clerk	4 50 per day	722 25	36 09	758 34
M. S. Smith	Leveler	5 00 per day	790 00	1 20	791 20
J. B. Barrett	Leveler	5 00 per day	380 00	....	380 00
E. P. Strowger	Leveler	5 00 per day	810 00	1 75	811 75
E. P. Strowger	Leveler	4 50 per day	121 50	....	121 50
W. T. Huber	Leveler	4 50 per day	1,462 50	68 50	1,531 00
W. G. Harger	Leveler	4 50 per day	558 00	5 08	563 08
L. R. Barnes	Leveler	4 50 per day	468 00	....	468 00
E. A. Bonney	Inspector	4 50 per day	657 00	....	657 00
Harry D. Waldo	Inspector	4 50 per day	1,422 00	26 03	1,448 03
Chas. H. Fosdick	Inspector	4 50 per day	1,147 50	16 54	1,164 04
Chas. A. Carruth	Inspector	3 50 per day	101 50	3 48	104 98

Improvement of Public Highways — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Thos. J. Love	Inspector	$4 50 per day	$756 00	$1 55	$757 55
R. T. Webster	Inspector	4 50 per day	567 00	15 87	582 87
Chas. D. Wager	Inspector	3 50 per day	87 50		87 50
John A. Harold	Inspector	3 50 per day	42 00		42 00
Geo. W. Rogers	Inspector	3 50 per day	42 00		42 00
L. S. Webster	Inspector	3 50 per day	497 00		497 00
Chas. F. Swain	Inspector	3 50 per day	252 00		252 00
Louis Wachtel	Inspector	3 50 per day	227 50	87 18	314 68
L. A. MacSweeney	Inspector	3 50 per day	115 50		115 50
L. A. MacSweeney	Inspector	4 50 per day	67 50	75	68 25
Harvey G. Eckler	Inspector	3 50 per day	234 50	4 05	238 55
Edwin M. Secrist	Inspector	3 50 per day	98 00		98 00
Chas. A. Carruth	Draughtsman	4 50 per day	589 50	36 77	626 27
E. A. Bonney	Draughtsman	4 50 per day	477 00		477 00
A. B. Chappell	Draughtsman	4 00 per day	12 00		12 00
B. E. Moses	Draughtsman	4 00 per day	100 00	1 70	101 70
H W. Lockwood	Draughtsman	4 00 per day	108 00		108 00
H. W. Lockwood	Draughtsman	5 00 per day	845 00		845 00
H. G. McKelvey	Draughtsman	5 00 per day	1,580 00		1,580 00
Edward A. Zorsch	Draughtsman	5 00 per day	162 00		162 00
Tracy B. Smith	Draughtsman	5 00 per day	1,210 00	17 24	1,227 24
Chas. R. Zorsch	Draughtsman	4 50 per day	1,071 00	3 13	1,074 13
T. Seward Summers	Draughtsman	5 00 per day	169 00		169 00
C. J. Bean	Rodman	4 00 per day	900 00	20 34	920 34
Clarence M. Colony	Rodman	4 00 per day	1,272 00	2 58	1,274 58
R. T. Webster	Redman	4 00 per day	56 00		56 00
Joseph W. Howe	Rodman	4 00 per day	1,296 00	49 06	1,345 06
B. E. Moses	Rodman	4 00 per day	1,160 00	18 00	1,178 00
Harry J. Simmelink	Rodman	3 50 per day	1,092 00	38 27	1,130 27
George C. Andrews	Rodman	3 50 per day	210 00		210 00
L. R. Barnes	Rodman	3 50 per day	185 50		185 50
L. R. Barnes	Chainman	3 00 per day	417 00	8 28	425 28
Chas. F. Swain	Chainman	3 00 per day	489 00		489 00
James S. Douglass, Jr	Chainman	2 50 per day	225 00		225 00
Arthur E. Williams	Laborer	2 00 per day	96 00		96 00
W. S. Cameron	Laborer	2 00 per day	94 00		94 00
Geo. W. Rogers	Laborer	2 00 per day	420 00		420 00
Edwin M. Secrist	Laborer	2 00 per day	288 00	4 10	292 10
S. A. Patterson	Laborer	2 00 per day	226 00	27 00	253 00
J. M. Inderlied	Laborer	2 00 per day	304 00	29 00	333 00
Geo. H. Menzies	Laborer	2 00 per day	94 00		94 00
Howard B. Graves	Laborer	2 00 per day	92 00		92 00
Carl Oelkers	Laborer	2 00 per day	98 00		98 00
Finla L. Jones	Laborer	2 00 per day	412 00		412 00
Fred. M. Douglass	Laborer	2 00 per day	512 00		512 00
Harvey G. Eckler	Laborer	2 00 per day	330 00		330 00
Karl Burling	Laborer	2 00 per day	72 00		72 00
T. M. Quinn	Laborer	2 00 per day	258 00		258 00
Peter B. Brown	Laborer	2 00 per day	70 00		70 00
Edward L. Wick	Laborer	2 00 per day	224 00		224 00
Wm. H. Ginnity	Laborer	2 00 per day	288 00		288 00
Bryant C. Hudson	Laborer	2 00 per day	224 00		224 00
Henry Engler	Laborer	2 00 per day	328 00		328 00
Harry B. Harrison	Laborer	2 00 per day	504 00		504 00
L. S. Webster	Laborer	2 00 per day	172 00		172 00
Raymond B. Widener	Laborer	2 00 per day	96 00		96 00
Harry B. Byington	Laborer	2 00 per day	8 00	1 24	9 24
John B. Forrest	Laborer	2 00 per day	388 00		388 00
Harry T. Tuthill	Laborer	2 00 per day	360 00		360 00
Raymond T. Dempsey	Laborer	2 00 per day	404 00		404 00
R. B. Everets	Laborer	2 00 per day	400 00		400 00
Delos T. Simpson	Laborer	2 00 per day	290 00		290 00
Fred K. Freemesser	Laborer	2 00 per day	170 00		170 00
Harry R. Breeze	Laborer	2 00 per day	376 00		376 00
L. A. MacSweeney	Laborer	2 00 per day	122 00		122 00
Peter Drago	Laborer	2 00 per day	8 00		8 00
Michael Lahey	Laborer	2 00 per day	276 00		276 00
Michael J. McCarthy	Laborer	2 00 per day	298 00		298 00
Dan. C. McCarthy	Laborer	2 00 per day	330 00		330 00
Thomas J. Smith	Laborer	2 00 per day	334 00		334 00
Harry Jordan	Laborer	2 00 per day	330 00		330 00
John C. Hoctor	Laborer	2 00 per day	344 00		344 00
Mitchell Chadwick	Laborer	2 00 per day	48 00		48 00

Improvement of Public Highways — (Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Edward W. Schlenker	Laborer	$2 00 per day	$246 00	$1 05	$347 05
Thomas Roden	Laborer	2 00 per day	166 00		166 00
Harry W. Driber	Laborer	2 00 per day	342 00		342 00
Peter Giaraffa	Laborer	2 00 per day	36 00		36 00
John A. Kelly	Laborer	2 00 per day	320 00		320 00
Albert Murphy	Laborer	2 00 per day	238 00		238 00
Frank Murtaugh	Laborer	2 00 per day	264 00		264 00
Martin Woock	Laborer	2 00 per day	274 00		274 00
Jacob Brown	Laborer	2 00 per day	270 00		270 00
Thomas H. Clarke	Laborer	2 00 per day	264 00		264 00
Frank Sheehan	Laborer	2 00 per day	230 00		230 00
Arthur F. Bechtold	Laborer	2 00 per day	128 00		128 00
Chas. Madden	Laborer	2 00 per day	96 00		96 00
Geo. A. Wright	Laborer	2 00 per day	262 00		262 00
H. H. Cook	Laborer	2 00 per day	228 00		228 00
John J. Kinney	Laborer	2 00 per day	144 00		144 00
John C. Mitchell	Laborer	2 00 per day	166 00		166 00
E. J. Fitzmartin	Laborer	2 00 per day	174 00		174 00
Louis J. Stauff	Laborer	2 00 per day	100 00		100 00
Wm. J. Berdel	Laborer	2 00 per day	26 00		26 00
Harold J. Spellman	Laborer	2 00 per day	122 00		122 00
Clarence S. Collins	Laborer	2 00 per day	212 00		212 00
Wm. L. Kelly	Laborer	2 00 per day	60 00		60 00
Lewis W. Abbott	Laborer	2 00 per day	132 00		132 00
Dean R. Hill	Laborer	2 00 per day	132 00		132 00
J. P. Colburn	Laborer	2 00 per day	102 00		102 00
John J. Bissing	Laborer	2 00 per day	182 00		182 00
W. H. Lines	Laborer	2 00 per day	36 00		36 00
Paul Howe	Laborer	2 00 per day	26 00		26 00
Geo. F. Poinan	Laborer	2 00 per day	104 00		104 00
Edmund A. Close	Laborer	2 00 per day	70 00		70 00
Frank Baker	Laborer	2 00 per day	76 00		76 00
Noah T. Clarke	Laborer	2 00 per day	52 00		52 00
Burwell Hamilton	Laborer	2 00 per day	82 00		82 00
L. F. Cashman	Laborer	2 00 per day	130 00		130 00
A. B. Roberts	Laborer	2 00 per day	130 00		130 00
John Clarey	Laborer	2 00 per day	136 00		136 00
Thomas M. Nolan	Laborer	2 00 per day	158 00		158 00
James Hogan	Laborer	2 00 per day	12 00	5 08	17 08
R. J. Curran	Laborer	2 00 per day	68 00		68 00
James J. Sullivan	Laborer	2 00 per day	32 00		32 00
Wm. Ward	Laborer	2 00 per day	66 00		66 00
James White	Laborer	2 00 per day	110 00		110 00
Edward F. La Due	Laborer	2 00 per day	54 00		54 00
O. W. Hard	Laborer	2 00 per day	68 00		68 00
R. A. Toole	Laborer	2 00 per day	46 00		46 00
Wm. F. Guenther	Laborer	2 00 per day	14 00		14 00
P. E. Connaughton	Laborer	2 00 per day	26 00		26 00
					$71,831 13

Incidental Expenses.

Stationery and printing	$159 10	
Livery	2,577 25	
Fuel and lights	5 50	
Postage	128 10	
Office rent	806 43	
Telephone and telegraph	624 51	
Miscellaneous	2,474 39	
		6,775 31
Total		$78,606 44

Maintenance and Repairs of Improved Public Highways.

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906; Chapter 170, Laws of 1907.

Road No.	NAME OF ROAD.	Town.	County.	Total.
69	Main street, section 1	Amherst	Erie	$6,952 01
129	River, sections 2 and 3	Tonawanda	Erie	60 00
27	Orchard Park, section 1	East Hamburg	Erie	69 50
66	Orchard Park, section 2	East Hamburg	Erie	279 69
67	Orchard Park, section 3	West Seneca	Erie	3,288 98
68	Orchard Park, section 4	West Seneca	Erie	3,036 11
272	Orchard Park, section 5	East Hamburg	Erie	1,157 79
2	Whites Corners, section 1	West Seneca Hamburg	Erie	4,011 71
88	Transit, section 1	Amherst Clarence	Erie	5 65
94	Monroe avenue	Brighton Pittsford	Monroe	2,178 34
78	Clifton	Chili	Monroe	2,478 41
62	West Henrietta	West Henrietta Brighton	Monroe	911 53
80	Hamlin, section 1	Clarkson	Monroe	1,271 04
81	Hamlin, section 2	Hamlin	Monroe	5,342 67
171	Lake, section 1	Sweden	Monroe	672 26
63	Scottsville, section 1	Chili	Monroe	873 35
79	Scottsville, section 2	Chili Wheatland	Monroe	4,151 91
83	Buffalo, section 2	Gates	Monroe	7,228 77
98	Webster, section 1	Irondequoit	Monroe	175 30
5	East avenue	Brighton Pittsford	Monroe	171 62
168	Dugway, section 1	Brighton Penfield	Monroe	330 80
169	Dugway, section 2	Penfield	Monroe	48 90
15	Hudson avenue, section 1	Irondequoit	Monroe	277 81
166	Penfield, section 1	Penfield	Monroe	35 82
167	Penfield, section 2	Penfield	Monroe	181 52
251	Griswold street	Royalton	Niagara	12 00
188	Bristol Valley, section 1	East Bloomfield Bristol	Ontario	313 70
187	Bristol	Canandaigua	Ontario	1,296 30
204	Naples–Atlanta, section 1	Naples	Ontario	177 67
205	Naples–Woodville	Naples	Ontario	457 91
146	Geneva–Canandaigua, section 1	Seneca	Ontario	2,730 11
207	Geneva–Canandaigua, section 2	Hopewell Canandaigua	Ontario	4,065 25
	Total			$54,244 43

Surveys for State Court of Claims.

Chapter 700, Laws of 1905.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
M. W. Wilbur	First resident engineer	$2,700 per year	$216 25	$141 05	$357 26
Geo. T. Keith	Resident engineer	2,400 per year	69 25	22 85	92 10
D. D. Waldo	Resident engineer	2,400 per year	322 69	158 94	481 63
Chas. M. Edwards	First assistant engineer	7 00 per day	84 00	48 15	132 15
Frank W. Bristow	Assistant engineer	6 00 per day	96 00	35 99	131 99
Tracy B. Smith	Draughtsman	5 00 per day	225 00	59 72	284 72
E. A. Bonney	Draughtsman	4 50 per day	4 50	....	4 50
E. P. Strowger	Leveler	5 00 per day	90 00	....	90 00
W. G. Harger	Leveler	4 50 per day	27 00	....	27 00
Thomas J. Love	Inspector	4 50 per day	13 50	1 10	14 60
B. E. Moses	Rodman	4 00 per day	8 00	....	8 00
Joseph W. Howe	Rodman	4 00 per day	24 00	....	24 00
H. J. Simmelink	Rodman	3 50 per day	17 50	....	17 50
D. S. Hollenbeck	Boatman	3 00 per day	21 00	....	21 00
Arthur E. Williams	Laborer	2 00 per day	10 00	....	10 00
Harvey G. Eckler	Laborer	2 00 per day	12 00	....	12 00
L. A. MacSweeney	Laborer	2 00 per day	58 00	....	58 00
George W. Rogers	Laborer	2 00 per day	46 00	....	46 00
					$1,812 45
Incidental Expenses.					
Livery				$81 50	
Postage				94	
Telephone and telegraph				17 87	
Miscellaneous				44 84	
					145 15
Total					$1,957 60

SUMMARY.

The foregoing tables are summarized as follows:

Ordinary Repairs to Canals.

1.	Erie canal, chapter 683, Laws of 1906	$8,889 50

Construction of Barge Canal.

2.	Construction of Barge canal, Erie canal, chapter 147, Laws of 1903	61,179 76

Improvement of Public Highways.

3.	Improvement of public highways, chapter 115, Laws of 1898; chapter 468, Laws of 1906	78,606 44
4.	Maintenance and repairs of improved public highways, chapter 115, Laws of 1898; chapter 468, Laws of 1906; chapter 170, Laws of 1907	54,244 43

Special Surveys.

5.	Surveys for State Court of Claims, chapter 700, Laws of 1905	1,957 60
	Total	$204,877 73

Table of Contracts Completed on the Western Division During the Fiscal Year Ending September 30, 1907.

Improvement of Public Highways.

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906.

CONTRACTOR.	Date of contract.	Character of work.	Contract price.	Final payment.
John Johnson	July 10, 1906	Reeds Corners road, No. 206, Ontario county	$18,700 00	$19,375 07
Henry P. Burgard	July 14, 1906	Geneva–Canandaigua (section 2) road, No. 207, Ontario county	45,000 00	49,387 02
Mosier & Summers	July 5, 1906	Griswold street road, No. 251, Niagara county	17,500 00	17,507 23
Frederick A. Brotsch	July 11, 1906	Clifton (section 2) road, No. 252, Monroe county	18,000 00	19,810 85
Frederick A. Brotsch	July 11, 1906	Little Ridge (section 4) road, No. 257, Monroe county	23,000 00	23,844 80
John Johnson	July 10, 1906	Orchard Park (section 5) road, No. 272, Erie county	12,000 00	12,784 21
Greece Construction Co.	July 13, 1906	Barnards Crossing (sections 1 and 2) road, No. 276, Monroe county	34,900 00	36,235 25
Henry C. Schroeder	July 10, 1906	Geneva–Canandaigua (section 3) road, No. 333, Ontario County	8,242 44	8,497 65
Henry C. Schroeder	July 10, 1906	Lyons–Geneva road, No. 334, Ontario county	12,465 50	13,594 05
Mosier & Summers	July 5, 1906	Victor–Mendon (section 1) road, No. 335, Ontario county	36,400 00	37,886 17
Costello & Nagle	Sept. 13, 1906	Grand Central avenue road, No. 357, Chemung county	14,250 00	14,425 30
McCarthy & Simerson	July 11, 1906	Dansville–Mt. Morris (section 3) road, No. 482, Livingston county	22,850 00	24,088 59
Chambers & Grady	July 9, 1906	Canandaigua–Victor road, No. 484, Ontario county	44,135 00	44,787 41
F. W. Knickenberg	June 30, 1906	Clarence–Hunts Corners road, No. 522, Erie county	31,800 00	35,659 62

TABLE OF CONTRACTS PENDING ON THE WESTERN DIVISION, SEPTEMBER 30, 1907.

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
F. A. Maselli & Co.	May 8, 1905	Contract No. 6	$1,588,912 00	$1,005,952 50	$381,069 00
Groton Bridge Co.	Aug. 10, 1906	Contract No. 7, bridges on contract No. 6		27,337 80	
The Great Lakes Construction Co.	Nov. 26, 1906	Contract No. 19	1,038,245 00	1,002,170 75	18,162 00

TABLE OF CONTRACTS PENDING ON THE WESTERN DIVISION, SEPTEMBER 30, 1907 — (Continued).

Improvement of Public Highways.

Chapter 115, Laws of 1898: Chapter 468, Laws of 1906.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Frederick A. Brotsch	July 11, 1906	Lyell road, No. 253, Monroe county	$22,000 00	$18,000 00	$16,660 35
Frederick A. Brotsch	July 11, 1906	Chili (section 1) road, No. 254, Monroe county	27,700 00	19,400 00	....
Frederick A. Brotsch	July 11, 1906	Chili (section 2) road, No. 255, Monroe county	26,000 00	16,070 00	....
Greece Construction Co	July 13, 1906	Little Ridge (section 3) road, No. 256, Monroe county	28,800 00	23,600 00	18,603 00
Gantz-Wilson Construction Co	July 18, 1906	Aurora-Buffalo (section 2) road, No. 263, Erie county	42,400 00	39,950 00	19,505 70
Erie County Board of Supervisors	July 10, 1906	Aurora-Buffalo (section 3) road, No. 264, Erie county	6,900 00	6,500 00	4,838 40
Frederick A. Brotsch	July 11, 1906	Hilton road, No. 269, Monroe county	28,000 00	26,000 00	22,505 13
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Left Fork-German Church-Redman road, No. 286, Monroe county	40,300 00	36,392 40	....
Monroe Roads Co	Sept. 17, 1907	Clover street (section 1) road, No. 294, Monroe county	44,900 00	40,475 34	1,154 70
Bovier & Rawlins	July 7, 1906	Erin-Horseheads road, No. 356, Chemung county	102,000 00	93,012 00	93,807 99
Gantz-Wilson Construction Co	July 18, 1906	Clinton street (section 1) road, No. 371, Erie county	55,900 00	45,925 00	83,187 40
Gantz-Wilson Construction Co	July 18, 1906	Clinton street (section 2) road, No. 372, Erie county	61,500 00	52,995 00	5,723 46
Wm. E. Baldwin & Co	July 9, 1906	Goodrich road, No. 373, Erie county	84,400 00	69,197 00	17,201 69
Thomas Hucknell	Aug. 31, 1906	Five Corners-Kuckville (section 1) road, No. 386, Orleans county	21,300 00	17,531 00	20,159 91
Thomas Hucknell	Aug. 31, 1906	Five Corners-Kuckville (section 2) road, No. 387, Orleans county	41,500 00	36,935 00	4,653 81
Chambers & Grady	July 9, 1906	Kendall Corners road, No. 388, Orleans county	24,900 00	22,700 00	7,559 10
F. W. Knickenberg	Sept. 27, 1907	Maple Ridge (section 1) road, No. 389, Orleans county	21,600 00	17,924 10	....
F. W. Knickenberg	Sept. 27, 1907	Maple Ridge (section 2) road, No. 390, Orleans county	19,000 00	16,636 25	....
Jeremiah T. Finch	Sept. 19, 1907	Latta road, No. 399, Monroe county	82,000 00	72,004 95	....
Henry C. Schroeder	Sept. 24, 1907	Portland avenue (section 2) road, No. 400, Monroe county	7,800 00	6,684 78	....
Good Roads Construction Co	Sept. 8, 1906	Suspension Bridge-Lewiston road, No. 475, Niagara county	25,500 00	23,500 00	28,848 45
Wm. E. Baldwin & Co	July 9, 1906	Transit (section 3) road, No. 507, Niagara county	48,000 00	38,699 00	30,648 86
Wm. E. Baldwin & Co	July 9, 1906	Hamburg-North Collins road, No. 523, Erie county	114,900 00	94,000 00	3,449 07
Mosier & Summers	Sept. 17, 1907	North Collins-Lawton road, No. 524, Erie county	73,900 00	64,585 85	....
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Lawton-Gowanda road, No. 525, Erie county	46,900 00	44,446 80	....
Stewart-Kerbaugh-Shanley Co	Sept. 20, 1907	Collins-Mortons Corners (section 1) road, No. 526, Erie county	37,300 00	36,454 25	....

TABLE OF CONTRACTS PENDING ON THE WESTERN DIVISION, SEPTEMBER 30, 1907 — (Concluded).

Improvement of Public Highways — (Continued).

Chapter 115, Laws of 1898; Chapter 468, Laws of 1906.

CONTRACTOR.	Date of Contract.	Character of work.	Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1907.
Stewart-Kerbaugh-Shanley Co...	Sept. 20, 1907	Hamburg-Springville (section 1) road, No. 527, Erie county..........	$87,500 00	$72,915 00	....
Stewart-Kerbaugh-Shanley Co...	Sept. 20, 1907	Hamburg-Springville (section 2) road, No. 528, Erie county..........	66,500 00	61,257 75	....
Stewart-Kerbaugh-Shanley Co...	Sept. 20, 1907	Alden-Town Line-Clinton street-Marilla road, No. 529, Erie county..........	49,000 00	45,596 90	....
Stewart-Kerbaugh-Shanley Co...	Sept. 20, 1907	Base Line-Grand Island road, No. 530, Erie county......	14,000 00	13,696 75	....
F. W. Knickenberg..........	June 30, 1906	East Pembroke-Batavia road, No. 586, Genesee county..	49,000 00	37,960 00	$18,717 84
Gantz-Wilson Construction Co...	Sept. 24, 1907	Olean-Allegany (section 2) road, No. 601, Cattaraugus county..........	39,000 00	35,963 19	....
Stewart-Kerbaugh-Shanley Co...	Sept. 20, 1907	Lewiston-Dickersonville road, No. 617, Niagara county..	35,000 00	32,330 00	....
Stewart-Kerbaugh-Shanley Co...	Sept. 20, 1907	Mt. Morris-Geneseo road, No. 622, Livingston county....	49,200 00	46,197 30	....

Maintenance and Repairs of Improved Public Highways.

Chapter 468, Laws of 1906; Chapter 686, Laws of 1906.

CONTRACTOR.	Date of contract.	Character of work.	Contract. price.	Payments to Sept. 30, 1907.
Pittsford Construction Co........	Aug. 14, 1906	East avenue road, No. 5, Monroe county..........	$11,817 00	$1,007 25
Pittsford Construction Co........	Aug. 14, 1906	Fairport road, No. 60, Monroe county..........	1,440 00	1,149 00
Pittsford Construction Co........	Aug. 14, 1906	Pittsford road, No. 61, Monroe county..........	285 00	136 80
Pittsford Construction Co........	Aug. 14, 1906	Monroe avenue road, No. 94, Monroe county..........	2,249 00	2,058 60
Pittsford Construction Co........	Aug. 14, 1906	Penfield (section 1) road, No. 166-A, Monroe county..........	148 25	....
Pittsford Construction Co........	Aug. 14, 1906	Penfield (section 2) road, No. 167-A, Monroe county..........	972 55	504 75
Grand Avenue Horse Co........	Aug. 9, 1906	Dugway (section 1) road, No. 168, Monroe county..........	9,569 00	4,976 90
Pittsford Construction Co........	Aug. 14, 1906	Dugway (section 2) road, No. 169-A, Monroe county..........	594 50	....
Grand Avenue Horse Co........	Aug. 9, 1906	Dugway (section 3) road, No. 170, Monroe county..........	466 00	....
John Johnson..........	Sept. 19, 1906	Bristol Valley (section 1) road, No. 188-A, Ontario county..........	153 00	....
John Johnson..........	Sept. 19, 1906	East Side Lake (section 1) road, No. 190-A, Ontario county..........	500 00	....
John Johnson..........	Sept. 19, 1906	Gorham Stanley road, No. 203-A, Ontario county..........	804 50	....

Report of Special Examiner of Highways.

Report of Tests.

Report of the Land Bureau.

Report of the Bureau of Bridges.

Report of Examination of New York-Vermont Boundary Line.

Report of Special Examiner of Highways.

Albany, N. Y., *September* 30, 1907.

Hon. Frederick Skene, *State Engineer and Surveyor:*

I have the honor to submit the following report of the work in the Money System Department for the fiscal year ending September 30, 1907.

The following tables will show the number of towns under the money system, the number of towns under the labor system in each county in the State exclusive of the counties of Kings, Queens, Richmond and New York which comprise the city of Greater New York; also the number of miles of highway which are under the money system and under the labor system and the amount of money raised for highway purposes and the amount of State aid paid to each county.

TABLE SHOWING A COMPARISON OF THE TOWNS AND MILEAGE UNDER THE MONEY AND LABOR SYSTEMS DURING THE YEAR 1907.

COUNTY.	Number of towns under money system.	Number of miles of highways under money system.	Number of towns under labor system.	Number of miles of highways under labor system.
Albany	8	943	2	147
Allegany	13	795	16	991
Broome	15	1,292	1	79
Cattaraugus	5	298	27	1,516
Cayuga	10	690	13	758
Chautauqua	21	1,702	4	213
Chemung	5	369	6	464
Chenango	16	1,361	5	337
Clinton	5	471	9	830
Columbia	9	687	9	589
Cortland	7	377	8	592
Delaware	15	1,748	4	421
Dutchess	20	1,529	0	0
Erie	10	867	15	977
Essex	9	670	9	661
Franklin	7	344	12	900
Fulton	1	75	9	659
Genesee	5	365	8	561
Greene	12	1,018	2	66
Hamilton	4	238	5	160
Herkimer	12	854	8	665
Jefferson	8	705	14	1,392
Lewis	5	378	13	990
Livingston	7	474	10	793
Madison	14	1,300	2	71
Monroe	11	797	8	536
Montgomery	4	368	6	436
Nassau	3	775	0	0
Niagara	3	248	9	762
Oneida	15	1,165	12	1,141
Onondaga	13	1,074	6	526
Ontario	12	942	4	393
Orange	18	1,391	2	153
Orleans	4	287	6	412
Oswego	7	494	14	1,148
Otsego	21	1,862	3	206
Putnam	5	371	1	93
Rensselaer	13	1,101	1	131
Rockland	5	361	0	0
Saratoga	13	1,009	7	480
St. Lawrence	21	2,007	11	898
Schenectady	5	416	0	0
Schoharie	15	1,143	1	82
Schuyler	4	270	4	466
Seneca	1	77	9	605
Suffolk	10	1,802	0	0
Sullivan	14	1,530	1	93
Steuben	17	1,415	15	906
Tioga	7	823	2	202
Tompkins	8	995	1	85
Ulster	17	1,585	3	120
Warren	3	265	8	661
Washington	12	1,079	5	371
Wayne	6	536	9	787
Westchester	19	908	0	0
Wyoming	11	758	5	323
Yates	7	586	2	157
Total	567	48,190	366	27,005

TABLE SHOWING AMOUNTS AVAILABLE FOR HIGHWAY PURPOSES UNDER THE MONEY SYSTEM DURING THE YEAR 1907.

COUNTY.	Highway tax, including poll tax and surplus from 1906.	Amount received from State, as State aid.	Total.
Albany	$32,151 11	$9,570 53	$41,721 64
Allegany	23,530 02	11,386 58	34,916 60
Broome	33,020 27	13,825 12	36,845 39
Cattaraugus	7,820 13	3,546 00	11,366 13
Cayuga	21,534 31	9,122 32	30,656 63
Chautauqua	40,613 78	18,509 20	59,122 98
Chemung	10,364 60	4,756 01	15,120 61
Chenango	27,522 39	12,882 75	39,905 14
Clinton	8,268 36	3,942 08	12,210 44
Columbia	21,395 99	8,551 07	29,947 06
Cortland	8,131 58	4,034 13	12,165 71
Delaware	47,433 84	23,439 73	70,873 57
Dutchess	74,078 68	24,567 30	98,645 98
Erie	51,458 60	17,093 81	68,552 41
Essex	30,341 21	10,903 17	41,244 38
Franklin	26,715 15	12,256 62	38,971 77
Fulton	1,700 83	740 00	2,440 83
Genesee	12,445 87	6,174 07	18,619 94
Greene	33,103 78	16,469 60	49,573 38
Hamilton	16,568 83	7,972 74	24,541 57
Herkimer	25,045 72	11,732 23	36,777 95
Jefferson	21,195 90	8,332 90	29,528 80
Lewis	10,178 61	5,040 11	15,218 72
Livingston	17,044 55	8,378 60	25,423 15
Madison	29,841 03	13,037 00	42,878 03
Monroe	49,519 90	17,502 26	67,022 16
Montgomery	7,496 13	3,585 57	11,081 70
Nassau	96,821 06	28,085 23	124,906 29
Niagara	8,795 34	4,309 32	13,104 66
Oneida	32,242 64	14,882 11	47,124 75
Onondaga	51,096 59	18,569 47	69,666 06
Ontario	37,080 87	15,173 88	52,254 75
Orange	60,172 38	29,595 52	89,767 90
Orleans	9,132 23	4,273 68	13,405 91
Oswego	18,389 26	8,470 19	26,859 45
Otsego	36,607 88	18,941 91	55,549 79
Putnam	16,252 16	7,182 50	23,434 66
Rensselaer	33,410 38	13,062 13	46,472 51
Rockland	32,053 72	7,499 73	39,553 45
St. Lawrence	65,274 66	27,019 68	92,294 34
Saratoga	25,675 82	11,483 12	37,158 94
Schenectady	13,651 81	6,464 70	20,116 51
Schoharie	23,817 41	10,923 27	34,740 68
Schuyler	5,286 79	2,239 82	7,526 61
Seneca	1,095 62	547 81	1,643 43
Steuben	34,369 63	16,147 15	50,516 78
Suffolk	147,686 01	49,098 42	196,784 43
Sullivan	40,978 94	24,582 50	65,561 44
Tioga	16,144 81	7,336 67	23,481 48
Tompkins	24,867 40	8,439 76	33,307 16
Ulster	49,570 53	25,094 71	74,665 24
Warren	8,827 42	2,917 00	11,744 42
Washington	22,901 87	10,172 61	33,074 48
Wayne	21,359 68	8,410 65	29,770 33
Westchester	227,061 50	34,815 67	261,877 17
Wyoming	20,311 23	9,832 48	30,143 71
Yates	16,283 48	7,867 18	24,150 66
Total	$1,858,739 29	$720,789 87	$2,579,529 16
Levied for bridge and miscellaneous purposes (estimate reports not all in)			971,533 58
Extraordinary repairs (estimate reports not all in)			60,394 41
Compensation of highway commissioners (estimate reports not all in)			279,217 49
Total			$3,890,674 64

The popularity and success of the money system of working roads is demonstrated by the fact that 567 towns, having 48,190 miles of highway to care for, have voluntarily adopted the money system, as against 366 towns, with 27,005 miles of highway, which are still working under the labor system, and by the further fact that during the past year only two towns in the entire State have voted to abandon the money system. A great many other towns have voted to adopt the money system, but the change does not become effective until January 1, 1909, owing to the fact that the vote was taken after July 1, this year. It is clear to my mind that by January 1, 1909, practically all of the towns of the State will have voluntarily adopted this system.

On assuming office January 1, last, I realized that one of the greatest difficulties in the money system was that the towns were not receiving their State aid until far too late in the year. Previous to 1907 it had been the custom of the Legislature to appropriate State aid money in the Supply Bill, and the Supply Bill is the last one passed by the Legislature and is a thirty-day bill. At your request this money was raised by a special bill this year and we were, therefore, able to get State aid to the various money system towns about two months earlier than they would otherwise have received it. Even this was not early enough. An effort should be made the coming year to get State aid to the towns not later than May first. Owing to the fact that under the new law, which goes into effect this fall, State aid is based on the assessed valuation per mile of highway, as equalized by the various boards of supervisors and State assessors, and as no equalization is made by the boards of supervisors on the property outside of incorporated villages in a township, it will be necessary for us to equalize each money system town in which there is an incorporated village. The immense amount of work which is thrown on the State Engineer's office under this new law would naturally delay sending out State aid. With a view toward preventing this delay we have established a set of uniform blanks to be used by the various town boards and boards of supervisors throughout the State in the money system towns in determining and reporting moneys for ordinary and extraordinary repairs and we have also established a uniform system of resolutions for levying highway taxes and also for extraordinary repairs by the various boards of supervisors.

In addition to this either one of the supervisors of highways or I myself will visit every board of supervisors in the State while in annual session this fall, for the purpose of explaining the advantage to them of this uniform system and for the purpose of explaining the necessity of making their reports to the State Engineer and State Comptroller early, to the end that State aid will not be delayed next year. It is thought that under this new uniform system no town will be able to defraud the State, as has happened in some cases in the past, by making ambiguous reports, and at the same time every town will get every cent that it is entitled to.

Another difficulty that is confronting us at the present time is, that the number of supervisors of highways (or inspectors), auditors of highway accounts, and the office force generally, have not kept pace with the demands which are being made upon us. I have only eight supervisors of highways and two auditors of highway accounts, to inspect 48,190 miles of road, hold schools of instruction and audit accounts amounting to $3,810,321.33 in 567 towns, scattered all over this State. There ought to be an increase in the number of supervisors of highways in order to properly inspect the highways and an increase in the number of auditors of highway accounts in order to properly audit the highway accounts.

During the present year all highway moneys, including State aid, have been held by the supervisor, as custodian, and paid out on the written order of the highway commissioner, the man who performed the work or furnished the material certifying on the back of the order before receiving payment. It is my intention to change the form of this order the coming year so that it will show the date on which the work is done, the number of hours, the kind of material or labor furnished and the amount, and the road on which the work is done. A blank will also be provided on the back of the order for the town board to mark the words "Audited by town board," to prevent possibility of an order being paid twice. It would seem as if this would safeguard the taxpayers' interests to the greatest possible extent.

During the present year the supervisors of highways have been required to make a weekly report showing the work done by them during the week. This is in addition to the ordinary detailed report of each town inspected. It is also my intention to require the town board and highway commissioner in making their agreement to lay out, at some time during the winter, their entire plan, or scheme of working the roads of their town, and to divide the town into a suitable number of districts, placing a foreman in charge of each district, and also to require the highway commissioners to procure necessary machinery and help during the winter months, so that the commissioners will be prepared with a complete and intelligent plan for working their roads early in the spring, when the soil is in a suitable condition.

All of the towns under the money system have been urged to build each year some roads of a permanent nature, such as gravel or crushed stone. Nearly every town in the State has some roads that ought to be permanently improved in addition to the roads which are on the State map for improvement under the fifty-million-dollar-bond issue. In the main these roads are short pieces, ranging from half a mile to two miles in length, and are not what are generally referred to as main highways. These roads can be built much cheaper by the local town officers under the money system than in any other way.

I am glad to be able to report that during the past year 132 towns have been building some stone roads. I find that there are 986 miles of stone roads now completed in the State, all built under the money system. A careful examination of the highway accounts, made by the supervisors of highways of this bureau, shows that in most cases no separate account has been kept of the cost of these roads. Payment for labor and material is simply made from the highway fund, regardless of whether the work was done on a stone road or on the ordinary dirt roads of the town, and in many cases the work runs through several years. That is to say, the grading would be done one year, the drainage taken care of in another year, the culverts built at still another time and the stone put on in the last year. It is, therefore, impossible in a majority of the towns to ascertain what these roads cost per mile to build.

The public is now realizing that it does very little good for them to complain to the local town officers and they are making complaints to the State Engineer's office by the thousand. All of these complaints are taken up with the highway commissioners by letter or through the supervisor of highways and I am happy to report that in almost every case, upon the request of the State Engineer to the commissioner, the roads are promptly repaired.

In holding schools of instruction during the coming winter the attention of the local town officers will be called to the fact that the period of agitation to create an interest in good roads is past and that the period of action is here, and that the farmers, the local merchants and the traveling public generally are looking to the State Engineer's office and to the local town officers to see that they get good roads in the towns operating under the money system.

Respectfully submitted,
STEPHEN RYAN,
Special Examiner of Highways.

Report of Tests.

TESTING LABORATORY — STATE HALL.

ALBANY, N. Y., *October* 1, 1907.

Hon. FREDERICK SKENE, *State Engineer and Surveyor:*

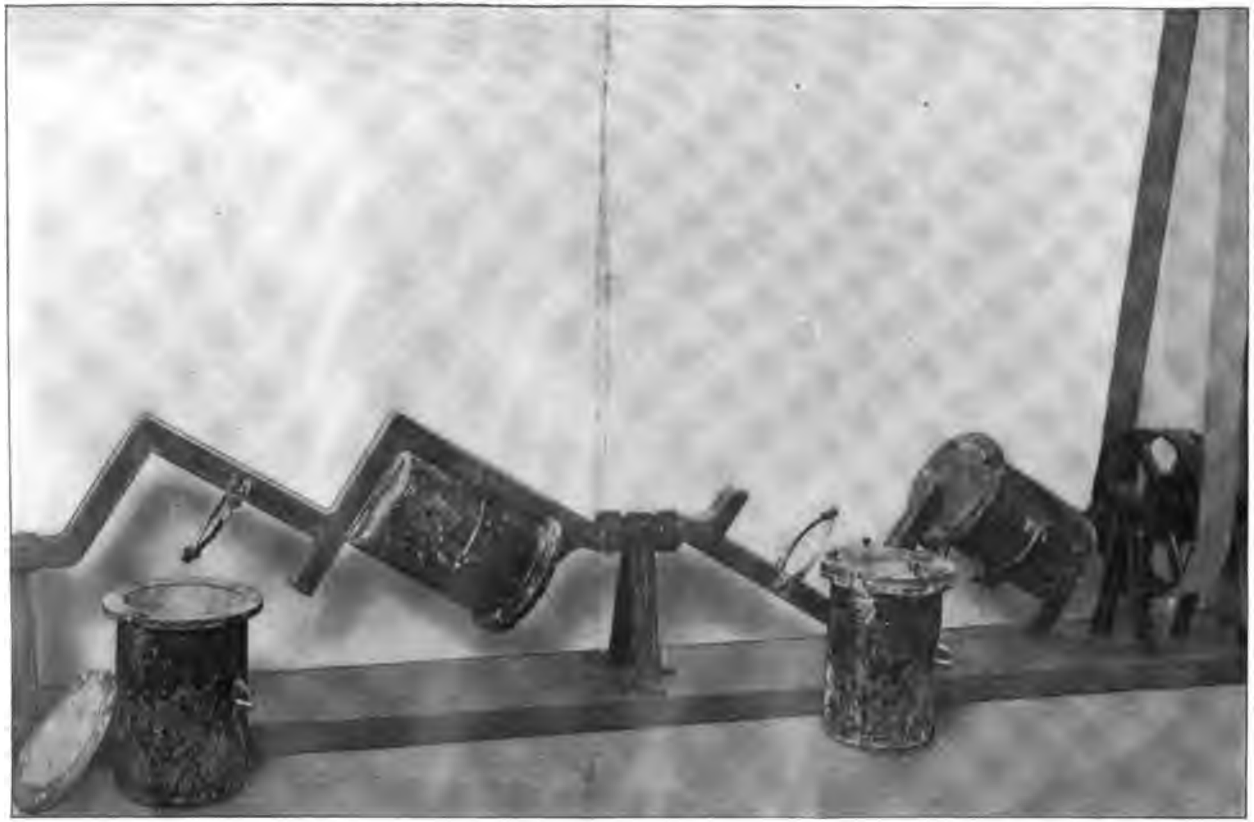
Sir.— I have the honor to submit the following report of the work of the testing laboratory of your Department for the fiscal year ending September 30, 1907.

The work of the year has been more than simply routine, for, besides the regular testing of cements, the scope of the laboratory has been extended and tests are now being made of sands as well as cements and the testing of stone for road use is about to be commenced. Many special tests of considerable variety have made the work of particular interest and value.

CEMENT TESTS.

The routine work of testing cement has been largely increased during the past year because of the greater amount of work being done upon the Barge canal and upon the public highways. The work done also includes a large number of tests made for the works under the direction of the State Architect. Although the laboratory for making these tests was enlarged about two years ago, it has been found necessary again to increase its capacity, in order to be able to do the work of the coming year. Plans are now being made for the increase in apparatus and it will be installed within a short time.

During the past year there have been submitted to this laboratory for tests 774 lots of cement samples, consisting of a total of 10,724 samples. The number of lots tested shows an increase of 63 per cent over the number tested during the previous year, while the number of samples shows an increase of 88 per cent during the same period. Of the total number of samples tested, 6,184, or 57.7 per cent, were for the Barge canal; 3,219, or 30.0 per cent,



TESTING LABORATORY.

Four-cylinder machine for making tests for wear by abrasion — the Deval test.

were for public highways; and 1,321 or 12.3 per cent, were for the State Architect.

Each sample submitted was tested for tensile strength at the end of 7 and 28 days, in the proportion of one part cement to three parts standard quartz sand. In addition to the tests for tensile strength, each lot of samples were given tests for fineness of grinding, for initial and hard sets, and for soundness by means of the steam tests, the normal-water test and the normal-air test.

During the year 76 series of special tests were made. For these about a thousand briquettes were made and included 424 briquettes which were tested to obtain the results of the various sands with cement. The other tests include several short and long period tests.

The number of failures to meet the requirements of the Department is proportionally much larger than during the previous year and shows the necessity of complete tests of all the cement proposed for use. The results show the following failures:

Portland cements.— Thirty-three lots, consisting of 435 separate samples, failed to meet the requirements of 92 per cent through a standard sieve of 10,000 meshes per square inch, while 3 lots, consisting of 32 samples, failed also to pass the requirements for a sieve of 2,500 meshes per square inch. There seems to be a continued tendency on the part of some manufacturers to refrain from efforts to secure especially fine grinding, since formerly practically all the lots passed the 92 per cent mark while now some cements average near it.

One lot, consisting of 8 samples, set too quickly in the test for hard set; while 14 lots, consisting of 186 samples, acquired both the initial and hard sets within the requirements.

Of the tests for tensile strength, 18 lots, consisting of 271 samples, failed to meet the requirements of 150 pounds per square inch in the 7-day test, but all showed good strength-gaining qualities and passed the 28-day requirements; and 5 lots, consisting of 45 samples, failed in both the 7-day and 28-day tests.

Twenty-six lots of cement, consisting of 378 samples, failed in the original accelerated tests for soundness, but some showed improvement in later tests.

Natural cements.— One lot of 30 samples failed in the tests for fineness through the sieve of 10,000 meshes per square inch and also failed in the accelerated tests.

Puzzolan cements.— One lot of 19 samples failed in the 7-day and 28-day tests for tensile strength.

Of the cement tested 99.3 per cent was Portland cement and only 0.7 per cent was natural and Puzzolan cements. The natural cement was used by the Department of the State Architect.

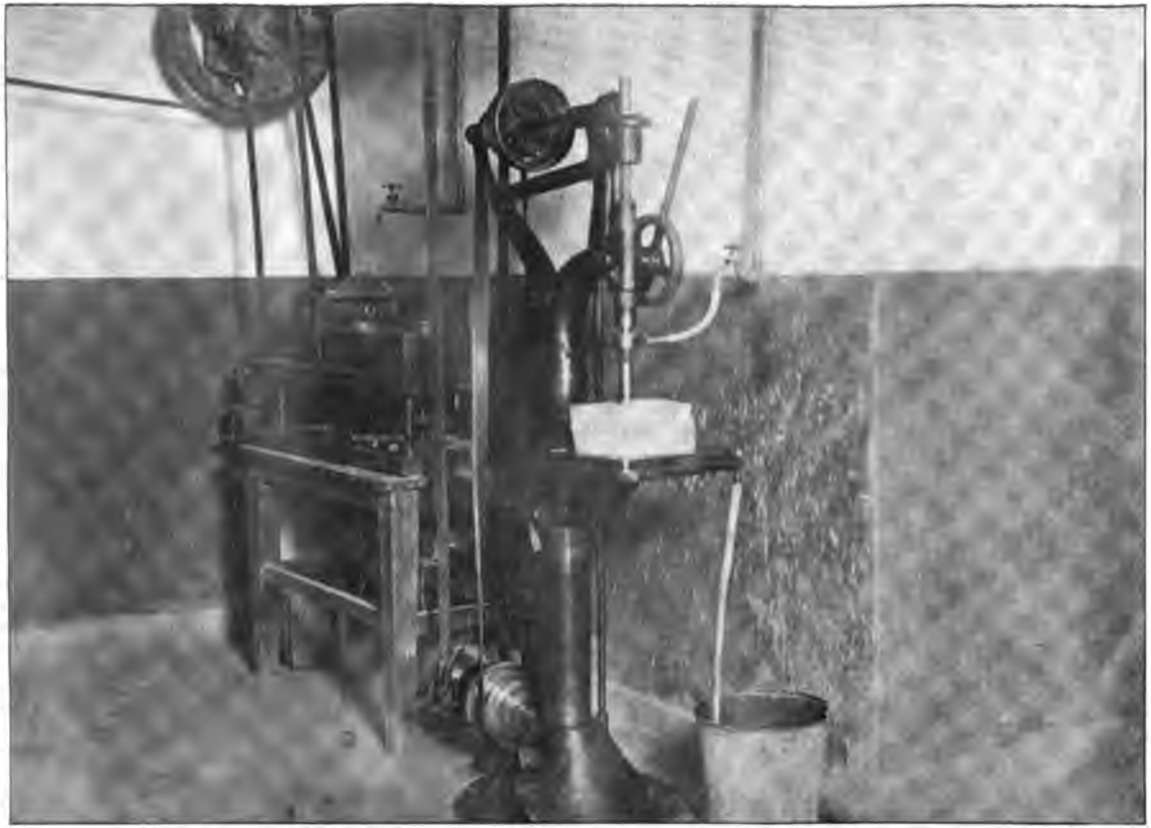
The brands represented by the samples received are about the same as heretofore and consisted of 24 American Portland, one natural, and 2 Puzzolan. Of the Portland brands, 9 were manufactured in New York, 12 in Pennsylvania and 3 in New Jersey.

Of the samples of Portland cement tested, 61.3 per cent was made in New York, a large increase over previous years.

A brief description of the method used in making the tests in this laboratory will probably make the results of the tests much better understood as well as more easily comparable with the results obtained in other testing laboratories. The method is practically the same as that recommended by the American Society of Civil Engineers. It is as follows:

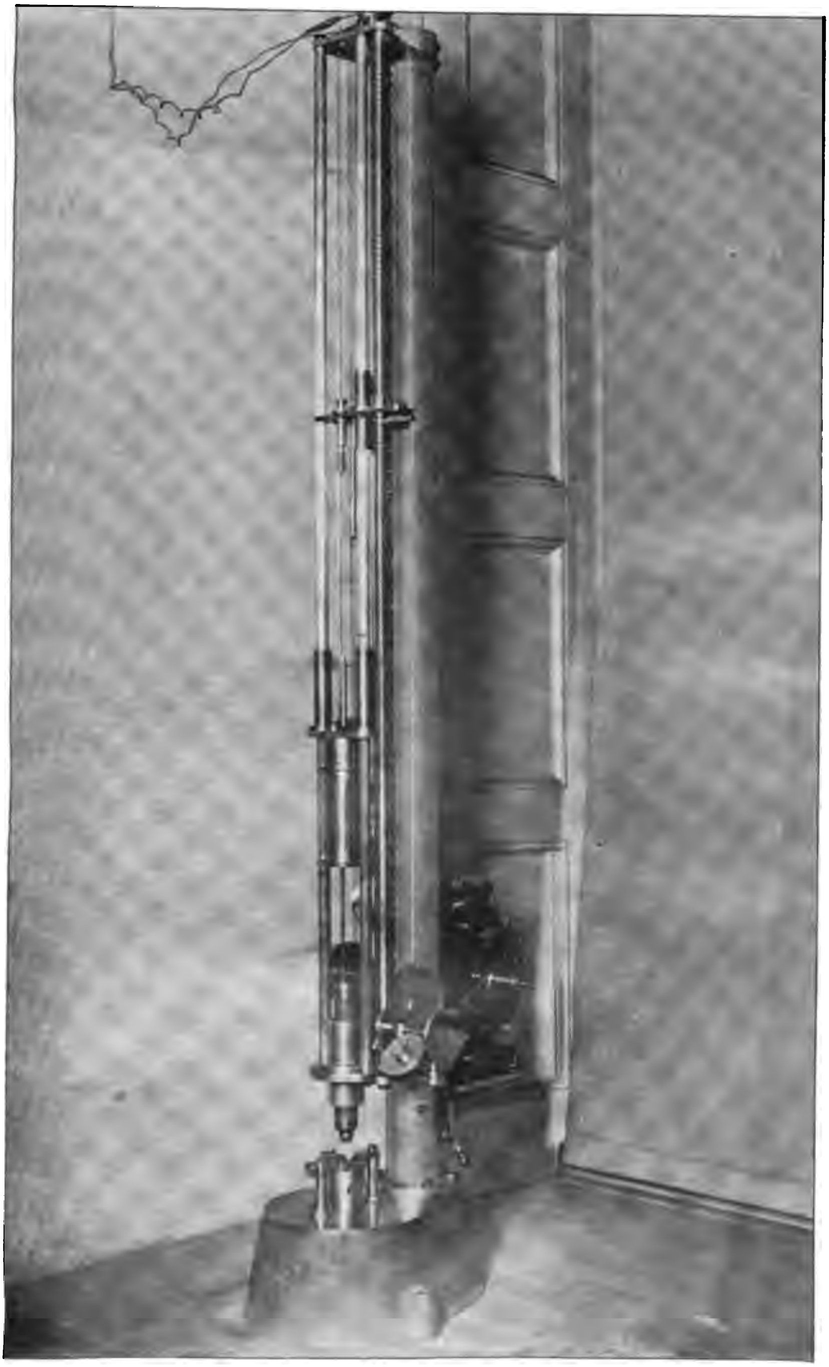
Sampling.— After the cement proposed to be used upon any contract work of the State has been delivered and well stored, the engineer in charge, or his representative, takes one sample from every tenth barrel of cement or from the equivalent of the tenth barrel when packed in sacks. Each sample is placed in a double envelope-bag upon which is printed such matter as when filled in by the person taking the sample will give the sample number, brand of cement, date of sampling and work upon which the cement is to be used. About twenty ounces of cement are taken for each sample. The samples are packed firmly and dry in wooden boxes and are then sent by express to this laboratory. Upon receipt here a portion of every sample is taken and these portions are thoroughly mixed into a large general sample. From this mixed sample is taken the cement used in making the tests of fineness, setting qualities, soundness, specific gravity and analysis.

Fineness.— The tests for fineness consist of drying the sample and then weighing on a scale capable of weighing to one ten-thousandth part of a pound a certain amount of the cement. This



Testing Laboratory.

Drill press with diamond core-drill. Diamond saw and lapidary plate. Small crusher behind saw.



Testing Laboratory.

Page impact machine for testing toughness of stone.

is carefully sieved through standard sieves of 2,500 and 10,000 meshes to the square inch. The sieving is done by means of a mechanical sifter operated by electricity, but all tests are completed by hand sifting. The residue is weighed and the percentages thus obtained. Ninety-nine per cent of the cement must pass the 2,500-mesh sieve and 92 per cent must pass the 10,000-mesh sieve.

Setting qualities.— From the mixed sample enough is also taken to make a ball of paste for the mould of the Vicat apparatus and for 3 neat pats. This is mixed up into a paste of normal consistency by adding from 18 to 25 per cent, by weight, of water to Portland cements and from 28 to 33 per cent to natural cements. After being thoroughly troweled this paste is moulded into a ball and pressed into the inverted mould and the paste struck off even with the bottom of the mould. It is then turned over and the top struck off even. This is then placed in the moist-air cabinet and tested from time to time by the Vicat needle. To be accepted, Portland cements must not take an initial set in less than 30 minutes or natural cements in less than 20 minutes; Portland cements must not take a hard set in less than an hour or require more than 10 hours to get hard set; natural cements must not take a hard set in less than 30 minutes or require more than 3 hours. The time is estimated from the moment of adding the water to the cement.

Soundness.— That cement paste which is left from the above test is moulded into 3 pats on glass plates about 3 inches by 4 inches in size. These pats are about one-half inch thick in the center and are drawn out to thin edges. As soon as made, the neat pats are placed in a moist-air cabinet and allowed to take their set. When the pats have hardened for 24 hours one is put in the steam of water at 212 degrees Fahr. for 5 hours. This is the "accelerated" or "hot-water" test; and if the pat, after being in the steam for 5 hours, shows no sign of blowing or cracking, it is reported as "good." The other pats are given normal-air and water tests by being kept respectively in air and water maintained at from 60 to 70 degrees Fahr.

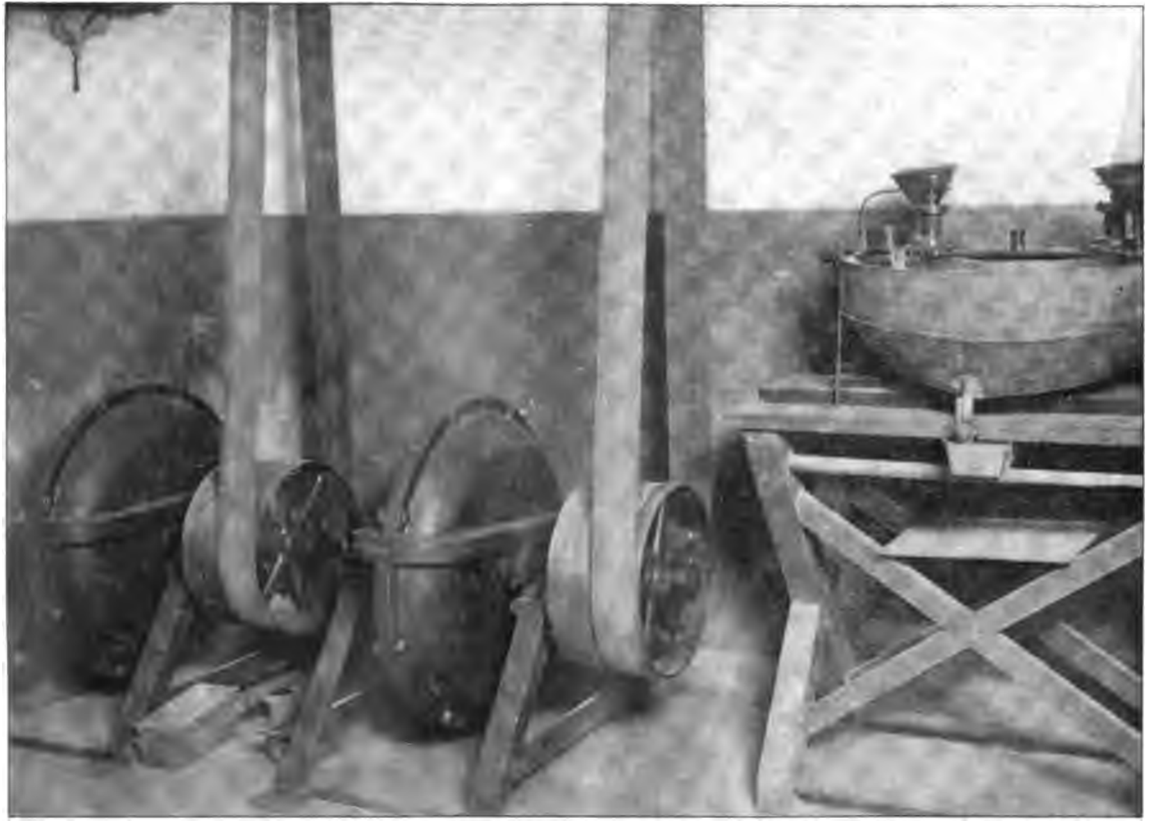
Tensile strength — Mortar.— For the tests for tensile strength, each sample is gaged separately with its proper proportion of standard crushed quartz sand, 1 part of cement to 3 parts of sand, parts by weight. As each sample is thus gaged it is put into a small pan and each is kept in the order of its number, so that the samples will not lose their identity. Each separate sample of cement and sand is thoroughly mixed dry and then from 9 to 11 per cent by weight of water is added to Portland cements and from 10 to 13½ per cent by weight to natural cements. The percentage used is such as will give a stiff mortar, which will show up water when the trowel is drawn heavily over it. This mortar is thoroughly troweled and is then put into the moulds.

Briquettes.— The mould, which is of brass and of the standard form recommended by the American Society of Civil Engineers, is first filled with loose mortar and this is carefully compacted by pressing down with the thumbs protected by rubber gloves. More loose mortar is placed in the mould and is pressed down as before. This makes about three-quarters inch of mortar in the mould, having been placed in about three-eighths-inch layers. The top layer is placed by striking a further addition of loose mortar with the back of the trowel. The briquette is then struck off even with the top of the mould. Two briquettes are made from each sample.

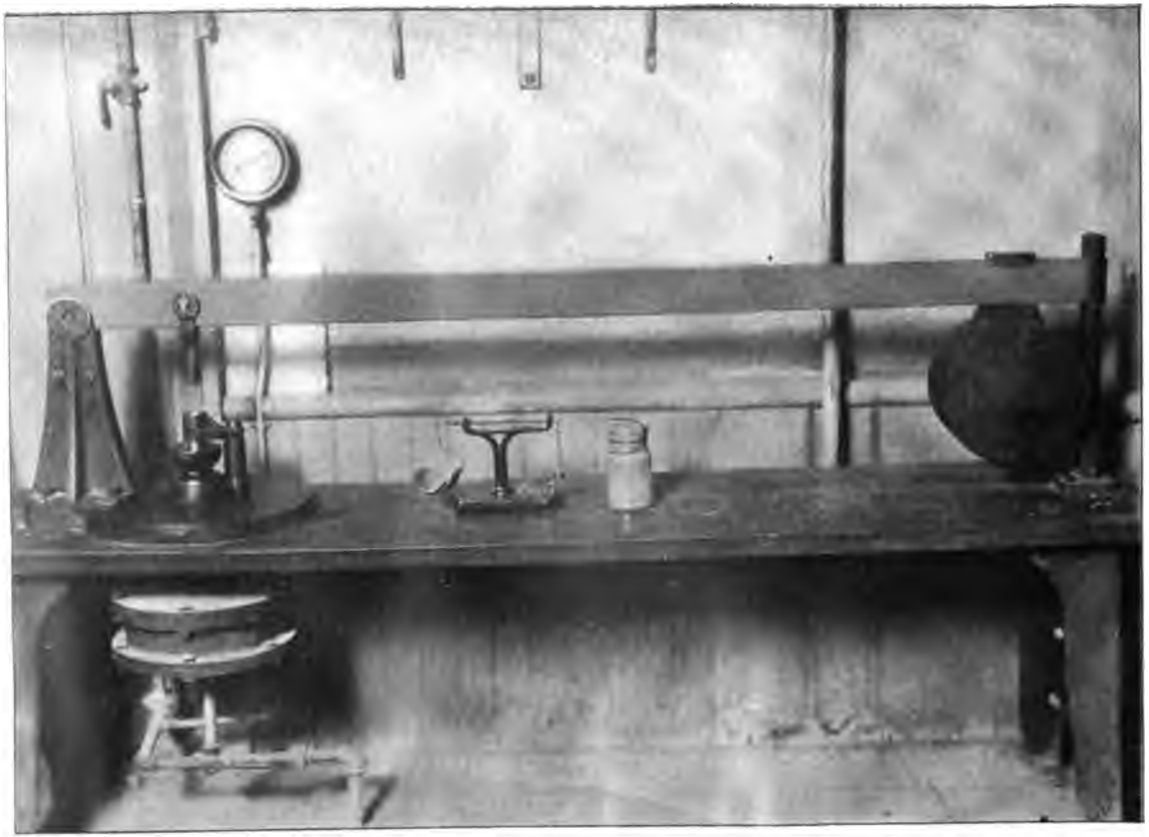
Treatment.— As soon as made, the briquettes are placed upon plates of glass and are placed in the moist-air cabinet, care being taken to keep them in their order so as to still retain their identity. After the mortar has hardened, the briquettes are removed from the moulds and replaced in cabinet. Twenty-four hours after gaging they are marked with a number which is given to each briquette consecutively as each is made, and are immersed and kept in water maintained at a temperature of about 60 to 70 degrees Fahr.

Breaking.—On the seventh day after gaging, the first test for tensile strength is given, and 21 days later, or on the 28th day after gaging, the second briquette of each sample is broken for tensile strength. Three improved Fairbanks cement testing machines are used to obtain these results. All the operations are so conducted that there is perfect uniformity in the treatment of all the samples.

Strength.— Portland cements, mixed as described, must show an average of at least 150 pounds per square inch in tensile strength in 7 days and an average of at least 240 pounds per square inch in 28 days. Natural cements, mixed as described, must show a tensile strength of an average of at least 40 pounds per square inch



TESTING LABORATORY.
Ball-mills for preparing paste for cementing-value tests. Machine for testing hardness of stone — similar to the Dorry machine.



Testing Laboratory.

Page hydraulic press for moulding briquettes for cementing-value tests.

in 7 days and an average of at least 100 pounds per square inch in 28 days.

Neat briquettes.— Tests for tensile strength of neat briquettes are seldom made, as the practice of this Department is to place the greater dependence upon the mortar tests. Whenever they are made, however, they are made and treated in a manner similar to that given mortar briquettes, excepting, of course, that a greater percentage of water is used — usually being about 1 per cent less than that used in gaging for the neat pats of that particular lot or brand. Neat briquettes of Portland cement, so made, must show an average of at least 500 pounds per square inch in tensile strength in 7 days; and neat briquettes of natural cement, similarly made, must show an average of at least 150 pounds per square inch in tensile strength in 7 days.

Analysis.— The method of analysis used in examination of cements is that recommended by the committee of the New York Section — Society for Chemical Industry.

Specific gravity.— The tests for specific gravity are made as suggested by the American Society of Civil Engineers — the Le Chatelier apparatus being used as recommended.

Acceptance.— At the end of the 7-day tests, all results obtained on tests of samples of cement proposed for use on all works except the Barge canal are submitted to Mr. Frank L. Getman, Deputy State Engineer, while results for cement proposed for use of Barge canal are submitted to Mr. William R. Hill, Special Deputy State Engineer, and if thought best, are held for the 28-day tests, the lots being accepted or rejected by them according as the results show that the cement passes or fails in the tests.

Our method of testing each sample separately for tensile strength has proven very satisfactory; in fact, by means of it, much poor cement has been discovered which would have stood the tests had all of the samples of the lot been blended. This method, however, makes necessary a larger equipment and a more complete system of operation than is necessary under the general method of testing a blended sample. Although the laboratory was enlarged during the past year, a further enlargement will probably be needed within another year. The effort, however, is made to maintain as complete a laboratory with as little expense as possible; but it is hoped that the laboratory and its results will be so complete as to be placed by experts as being among the best in the country.

The specifications for cement follow closely those recommended by the American Society for Testing Materials — vary from them only in some minor details.

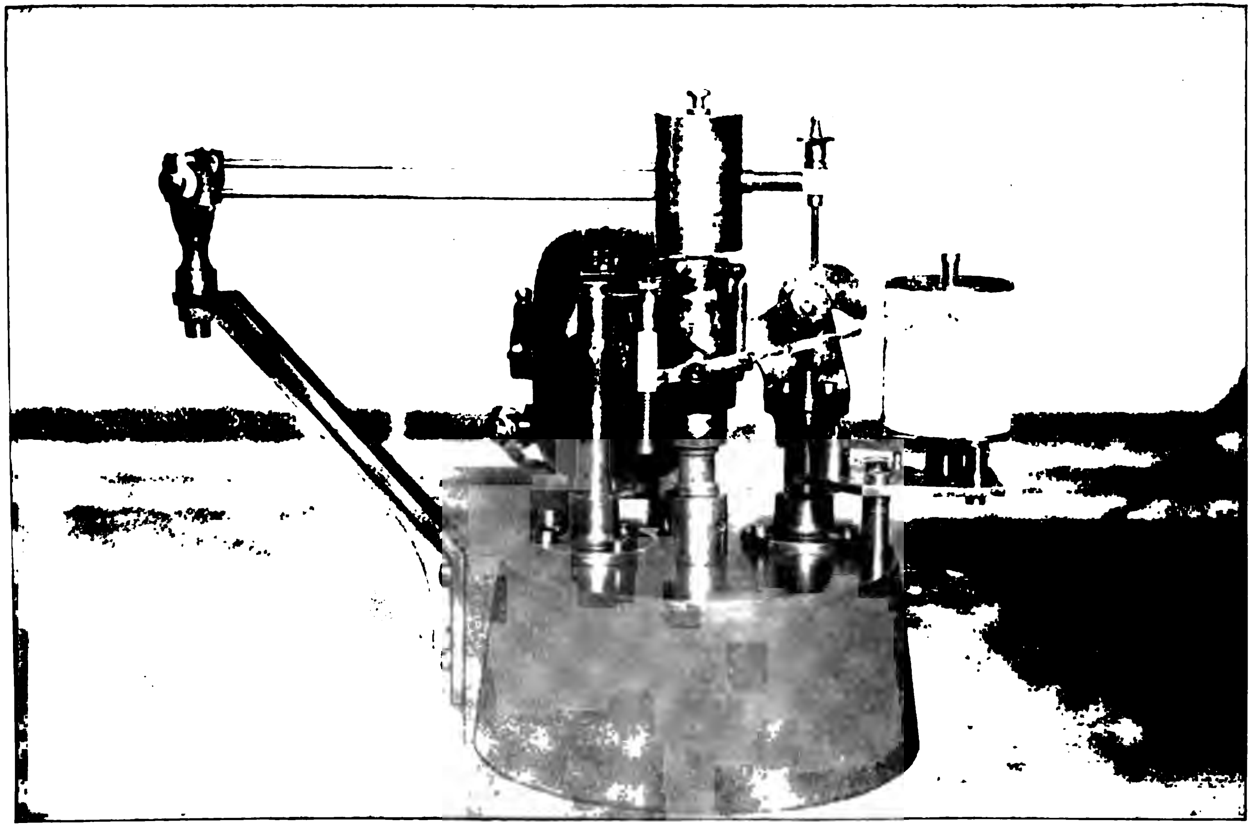
SAND TESTS.

During the past year the importance of thorough examination and tests of the sands proposed for use on the Barge canal has been recognized by the adoption of definite tests. The sands are examined under the microscope for this Department by a representative of the State Geologist and the characteristic elements and their proportions are noted. The tests made in this laboratory consist of tests for the following: Voids, loam, fineness and tensile strength with cement. The latter are made from the sand in its natural condition and washed; and the cement used is a "Standard" cement made by mixing together in the laboratory several brands of cement which run nearly alike in the regular tests. All tests for tensile strength cover at least 28 days, but many long-time tests are being carried.

This work of sand examination is just in its beginning, but results have already been obtained which have been very profitable to the Department.

STONE TESTS.

A laboratory for the testing of stone proposed for use on the improvement of the public highways and also for use in the large concrete structures of the Barge canal, has just been fitted and the work of testing is about to begin. Because of the lack of room in which to expand and also with the intention of eliminating as much noise as possible from the rest of the laboratory, a vault room has been built by the Department adjacent to the rooms in the State Hall now being used for the testing of cement. In this, apparatus specially designed for the testing of stone has been placed. These pieces of apparatus are modeled after those in the laboratory of the Office of Public Roads, United States Department of Agriculture, Washington, D. C., and consist of the following: A four-cylinder Deval abrasion machine, a hardness machine, a diamond



Testing Laboratory.
Page machine for determining the cementing-value of stone.

Testing Laboratory.
Cabinet for filing specimens. Microscope and specific gravity apparatus.

core-drill, a lapidary and diamond saw, 2 ball-mills, a small stone crusher, a Page hydraulic briquette molding machine, and an impact machine for testing toughness and another for securing cementing value — these latter being modeled after the new machines developed by Mr. Logan W. Page, Director, Office of Public Roads, and which are now being used in their laboratory. The motive power is furnished by a 3 H. P. motor. With this apparatus it will be possible to test 4 samples per day — the capacity of the laboratory at Washington. Other states have secured some of this apparatus but this Department is the first one to duplicate the National laboratory.

The tests and the methods of making the tests will follow those already established by the Office of Public Roads, United States Department of Agriculture. The tests are as follows: Per cent of wear, French coefficient of wear, hardness, toughness, cementing value, specific gravity, weight per cubic foot and absorption. While the work of testing road materials is comparatively of recent development, it has reached the stage where most excellent economic results are obtained and it is probable that, with coöperation between this Department and the Department at Washington, most profitable results will be obtained — certainly the State will be protected against the use of material not suitable for its public highways.

Very respectfully,

RUSSELL S. GREENMAN,

Assistant Engineer, in Charge of Tests.

Report of the Land Bureau of the State Engineer's Department.

Albany, *October* 1, 1907.

Hon. Frederick Skene, *State Engineer and Surveyor:*

Sir.— I have the honor to present herewith a report on the various matters pertaining to the Land Bureau of your Department for the fiscal year ending September 30, 1907.

The Commissioners of the Land Office have applications for grants of land under water which are referred to this Department for examination and report; as are also a large number of miscellaneous matters relating to State lands. These matters require careful inspection and naturally consume a great deal of time.

The maps and papers are examined to determine their correctness and proper form, both from an engineering standpoint and to insure their conformity to the rules and regulations of the Land Office.

In some cases it is also necessary to visit and inspect the locations of the proposed grants to decide as to the advisability of making the grants on the lines of the application, or, if necessary, to have them modified.

It is also at times deemed advisable to deny some of these applications on account of interference with navigation or with the rights of the public.

Some applications were contested or had remonstrances filed against them, and hearings have been necessary to determine the rights of the several interested parties and report the outcome to the Commissioners of the Land Office.

Maps have been made in this Department for the use of the State Engineer and Surveyor and the Commissioners of the Land Office, showing the lands under water adjacent to the shores of Albany, Columbia, Dutchess, Erie, Greene, Kings, Nassau, Niagara, Orange, Queens, Rensselaer, Richmond, Rockland, Suffolk, Ulster and Westchester counties that have been granted by the Commissioners.

These maps have all been brought up to date and are of great value for reference in adjusting land grants.

Fifty applications for grants of land under water were considered by this Department during the year; 5 were for purposes of commerce, and the remainder were for restricted beneficial enjoyment. The lands were in the following counties: Clinton, Dutchess, Jefferson, Kings, Nassau, Orange, Queens, Richmond, Suffolk, Ulster and Westchester.

The State Engineer and Surveyor has sold at public auction all of those unappropriated lands of the State which have been ordered to be sold by the Commissioners of the Land Office.

The records of the office show that there were held during the year 22 public auctions, at which 44 parcels of land were sold. The sum of $50,383.31 was realized therefrom.

Of these lands 32 parcels were acquired through the Comptroller's tax sales, 8 from foreclosure of loan mortgages, 1 from abandoned canal lands, and 3 from escheat or unappropriated lands. The lands are located in the following counties: Albany, Chautauqua, Chemung, Columbia, Franklin, Herkimer, Kings, Niagara, Onondaga, Queens, Richmond, Rockland, Saratoga, Schoharie and Ulster.

There has been the usual amount of correspondence and answering of inquiries from surveyors, lawyers, and others on matters pertaining to the original maps and descriptions of the Colonial and early State surveys filed in this office. The answering of such inquiries often requires much time and study, as there are frequently more than one survey of the same land made at different times by various surveyors, and none should be overlooked. These maps become more valuable as time passes; and as a large part of them are very old and describe lines of tracts of land which have become, in many instances, the boundaries of towns and counties, the value of those records becomes still greater.

For better preserving these records they have been rearranged, placed in bound volumes and indexed for convenience of reference. That it is the proper method for the care of these valuable papers, and that it affords greater facility of finding particular papers with the certainty that none have been overlooked, has already been fully demonstrated.

Respectfully,
MERRITT PECKHAM, JR.,
Assistant Engineer in Charge of Land Bureau.

Report of the Bureau of Bridges.

ALBANY, N. Y., *September* 30, 1907.

Hon. FREDERICK SKENE, *State Engineer and Surveyor:*

Sir.— I have the honor to report as follows for the fiscal year ending September 30, 1907:

On October 1, 1906, the total force of this Bureau consisted of 23 men. During the year there has been a gain of 9, and a loss of 9, making the present total force 23. During the year 2 Bridge Draughtsmen have been promoted to the position of Bridge Designer and 2 Bridge Designers have been promoted to the position of Assistant Engineer. The force now consists of the Chief Bridge Designer, Assistant Chief Bridge Designer, 9 Bridge Designers, 2 Assistant Engineers, 1 Mechanical Engineer and Draughtsman, 6 Bridge Draughtsmen, 2 Junior Bridge Draughtsmen and 1 laborer.

More than 95 per cent of the work in this Bureau during the past year has consisted in the preparation of plans, specifications and estimates of cost for structures to be built in connection with the improvement of the canals as authorized by chapter 147, Laws of 1903. The work done includes plans for some 30 highway bridge superstructures, and 24 substructures of the improved type described in my last annual report; also lock-gates, needle-dams and valves for 12 locks and over 1,200 linear feet of movable dams for the Mohawk river; 6 lift guard-gates; 1 swing, lift guard-gate; 1 automatic movable dam; besides much miscellaneous work and many plans now in the process of preparation.

Plans and estimates have been prepared at the request of the Superintendent of Public Works for a skew bascule bridge over the Oswego canal at North Salina street, Syracuse.

The rolled-steel shapes used for bridge superstructures are rolled at several of the principal steel-mills of the United States and are manufactured into trusses, floor-beams, etc., at the shops of the various bridge companies. On account of the large expense attaching thereto, it has been impracticable for this Bureau to have men in its employ located at the mills and shops for the purpose of making the necessary mill and shop inspection required by the specifications on what are comparatively small amounts of material. Such inspection has, therefore, been regularly made by a firm of inspecting engineers, appointed by the State Engineer and Surveyor. These engineers are able to make the inspection at low cost because their representatives inspect larger quantities of material for other purposes in connection with the materials inspected for the State. Reports of mill and shop inspection are regularly received and upon receipt are carefully examined in detail and placed on file.

Shop-drawings of all structural steel and machinery for new State bridges are submitted by the contractors for approval before any shop-work is done. These drawings are carefully examined and are approved after having been corrected to conform with the requirements of the contract-drawings and specifications.

During the session of the Legislature many approximate estimates of cost were made for various bridges and steel structures provided for by those bills which were referred to the State Engineer.

During the year existing bridges over the canals have been examined at the request of the Superintendent of Public Works. Reports as to the condition of these bridges, with recommendations as to necessary repairs, have been made to the State Engineer. Plans for strengthening existing bridges or for building new bridges over the canals, submitted to the Superintendent of Public Works by street-railway companies in connection with petitions for permission to cross the canal, have been carefully examined and reports made thereon to the State Engineer.

Under section 145 of chapter 568 of the Revised Statutes, many town officers throughout the State have made requests for the examination and approval of stress-sheets, shop-drawings, etc., for new bridges or for an examination of both old and new structures. Upon receipt of such request, examination has been made as promptly as possible.

Requests for examination of town bridges are frequently made after the bridge is entirely completed, at which time it is impracticable to amend the contract-plans or specifications or to certify that the quality of the materials used is satisfactory. It is, therefore, often impossible to give unqualified approval to the completed structure. Far more satisfactory results are obtained when the town submits contract-plans and specifications for approval before the contract is signed. All town bridges of whatever span should be designed to conform in all respects to the best modern specifications and to carry in safety a steam road-roller rated at 10 tons (actual weight when loaded 13 tons), unless the authorities of the town should, after due consideration, decide that for special reasons it is not necessary to build a structure capable of safely carrying so great a load. Provisions should also always be made for the mill-inspection of material and the shop-inspection of workmanship by some competent firm of inspecting engineers. To secure these results, it is suggested as desirable that the Highway Law of the State be amended to require that, before contracts for new highway bridges are signed, the plans and specifications therefor shall be examined and approved by the State Engineer.

Constant effort has been made to do the work assigned to this Bureau with promptness and at as low a cost as is consistent therewith.

Respectfully submitted,

WM. R. DAVIS,

Chief Bridge Designer.

New York-Vermont Boundary Line.

ALBANY, N. Y., *September* 30, 1907.

Hon. FREDERICK SKENE, *State Engineer and Surveyor:*

SIR.— I submit herewith a report of the inspection of the monuments marking the boundary line between the States of New York and Vermont. This line, as rerun and reëstablished in 1903 and 1904, was marked by 101 granite monuments set in a concrete base, of which 100 remain standing and in good condition.

Starting at the intersection of the three States, New York, Vermont and Massachusetts, the boundary line extends about ½ mile westerly to monument No. 1, and thence in a general northerly direction to the Poultney river, where the line, as marked on the ground, ends.

Monument at corner of the three States, New York, Vermont and Massachusetts.— In good condition, shaft leans 1½ inches to the west.

Monument No. 1.— In good condition, shaft vertical.
Monument No. 2.— In good condition, shaft vertical.
Monument No. 3.— In good condition, shaft vertical.
Monument No. 4.— In good condition, shaft vertical.
Monument No. 5.— In good condition, shaft vertical.
Monument No. 6.— In good condition, shaft vertical.
Monument No. 7.— In good condition, shaft vertical.
Monument No. 8.— Shaft leans 1½ inches to the northeast, otherwise in good condition.
Monument No. 9.— In good condition, shaft vertical.
Monument No. 10.— Shaft leans 2 inches to the southeast, otherwise in good condition.
Monument No. 11.— Shaft leans 3 inches to the southwest, otherwise in good condition.
Monument No. 12.— In good condition, shaft vertical.
Monument No. 13.— In good condition, shaft vertical.
Monument No. 14.— In good condition, shaft vertical.
Monument No. 15.— In good condition, shaft vertical.

Monument No. 16.— In good condition, shaft vertical.
Monument No. 17.— In good condition, shaft vertical.
Monument No. 18.— In good condition, shaft vertical.
Monument No. 19.— In good condition, shaft vertical.
Monument No. 20.— Shaft leans 2 inches to the northeast, otherwise in good condition.
Monument No. 21.— Shaft leans 1 inch to the northeast, otherwise in good condition.
Monument No. 22.— In good condition, shaft vertical.
Monument No. 23.— Shaft leans 1 inch to the south, otherwise in good condition.
Monument No. 24.— In good condition, shaft vertical.
Monument No. 25.— In good condition, shaft vertical.
Monument No. 26.— In good condition, shaft vertical.
Monument No. 27.— Shaft leans 1 inch to the southeast, otherwise in good condition.
Monument No. 28.— In good condition, shaft vertical.
Monument No. 28–A.— In good condition, shaft vertical.
Monument No. 29.— In good condition, shaft vertical.
Monument No. 30.— In good condition, shaft vertical.
Monument No. 31.— In good condition, shaft vertical.
Monument No. 32.— In good condition, shaft vertical.
Monument No. 33.— In good condition, shaft vertical.
Monument No. 34.— In good condition, shaft vertical.
Monument No. 35.— Shaft leans 1 inch to the southwest, otherwise in good condition.
Monument No. 36.— In good condition, shaft vertical.
Monument No. 37.— In good condition, shaft vertical.
Monument No. 38.— In good condition, shaft vertical.
Monument No. 39.— In good condition, shaft vertical.
Monument No. 40.— In good condition, shaft vertical.
Monument No. 41.— In good condition, shaft vertical.
Monument No. 42.— In good condition, shaft vertical.
Monument No. 43.— In good condition, shaft vertical.
Monument No. 44.— In good condition, shaft vertical.
Monument No. 45.— In good condition, shaft vertical.
Monument No. 46.— In good condition, shaft vertical.
Monument No. 47.— In good condition, shaft vertical.

Monument No. 48.— In good condition, shaft vertical.
Monument No. 49.— Shaft leans 2 inches to the southwest, otherwise in good condition.
Monument No. 50.— In good condition, shaft vertical.
Monument No. 51.— In good condition, shaft vertical.
Monument No. 52.— In good condition, shaft vertical.
Monument No. 53.— In good condition, shaft vertical.
Monument No. 54.— In good condition, shaft vertical.
Monument No. 55.— Triangular piece, 6 inches by 3 inches chipped out of the northeast side, shaft vertical.
Monument No. 56.— In good condition, shaft vertical.
Monument No. 57.— In good condition, shaft vertical.
Monument No. 58.— In good condition, shaft vertical.
Monument No. 59.— In good condition, shaft vertical.
Monument No. 60.— In good condition, shaft vertical.
Monument No. 61.— In good condition, shaft vertical.
Monument No. 62.— In good condition, shaft vertical.
Monument No. 63.— In good condition, shaft vertical.
Old Monument.— "Vermont–New York 1814."— Leans 1 inch to the south, otherwise in good condition.
Monument No. 64.— In good condition, shaft vertical.
Monument No. 65.— In good condition, shaft vertical.
Monument No. 66.— In good condition, shaft vertical.
Monument No. 67.— In good condition, shaft vertical.
Monument No. 68.— In good condition, shaft vertical.
Monument No. 69.— In good condition, shaft vertical.
Monument No. 70.— In good condition, shaft vertical.
Monument No. 71.— In good condition, shaft vertical.
Monument No. 72.— In good condition, shaft vertical.
Monument No. 73.— In good condition, shaft vertical.
Monument No. 74.— In good condition, shaft vertical.
Monument No. 75.— In good condition, shaft vertical.
Monument No. 76.— In good condition, shaft vertical.
Monument No. 77.— In good condition, shaft vertical.
Monument No. 78.— In good condition, shaft vertical.

Monument No. 79.— Shaft leans ½ inch to the southwest, otherwise in good condition.

Monument No. 80.— In good condition, shaft vertical.

Old Monument.— "Vermont-New York 1814." In good condition.

Monument No. 81.— In good condition, shaft vertical.

Monument No. 82.— In good condition, shaft vertical.

Monument No. 83.— In good condition, shaft vertical.

Monument No. 84.— In good condition, shaft vertical.

Monument No. 85.— In good condition, shaft vertical.

Monument No. 86.— In good condition, shaft vertical.

Monument No. 87.— In good condition, shaft vertical.

Monument No. 88.— In good condition, shaft vertical.

Monument No. 89.— In good condition, shaft vertical.

Monument No. 90.— Shaft leans 1 inch to the southeast, otherwise in good condition.

Monument No. 91.— In good condition, shaft vertical.

Monument No. 92.— In good condition, shaft vertical.

Monument No. 93.— In good condition, shaft vertical.

Monument No. 94.— In good condition, shaft vertical.

Monument No. 95.— In good condition, shaft vertical.

Monument No. 96.— In good condition, shaft vertical.

Monument No. 97.— In good condition, shaft vertical.

Monument No. 98.— In good condition, shaft vertical.

Monument No. 99.— Shaft leans 4 inches to the southeast, otherwise in good condition.

Monument No. 100.— Shaft leans 1 inch to the southwest, otherwise in good condition.

Monument No. 101.— This monument and the ground on which it stood were carried away in the spring freshet of 1907.

Respectfully submitted,

WM. R. GORDON.

REPORT

OF

Co-operation of United States Geological Survey

WITH

STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK.

1907.

Coöperative Topographic Survey of New York.

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,

WASHINGTON, D. C., *January* 17, 1908.

Hon. FREDERICK SKENE, *State Engineer and Surveyor, Albany, N. Y.:*

Sir.— I have the honor to make the following report of the results of the coöperative topographic survey of New York for the year 1907–1908:

Allotments.

The terms of the supplemental agreement signed by us July 23 and July 26, 1907, provided for the continuation of the coöperative topographic surveys of the State, and extended the original agreement entered into by the State Engineer and the Director of the United States Geological Survey, June 30, 1905, to cover the details of such coöperation. In this supplemental agreement we provided that the State and the United States Geological Survey should each expend an additional sum of not less than $8,000 during the government fiscal year ending June 30, 1908. Under the terms of our agreement of the previous year the State allotted $9,500, and the United States Geological Survey, $9,500, for coöperation. Of this sum there was available at the beginning of the field season of 1907, $2,192.59, making the total sum available to June 30, 1908, $18,192.59. Of this sum, there has been expended to January 1, 1908, $11,562.83, leaving a balance, on the part of New York, of $1,110.36, and of the United States Geological Survey, of $5,519.40, a total of $6,629.76, to be expended for the payment of office salaries involved in the draughting of the maps and for the preliminary field work of 1908.

Results.

The immediate charge of the coöperative surveey was under Mr. Frank Sutton, Geographer in charge of the Atlantic Division of Topography of the United States Geological Survey, with Messrs. J. H. Jennings and Van H. Manning, topographers, as assistants. During the season of 1907 no funds were expended for the extension of either primary control or precise levels, as sufficient data of this kind remained available from preliminary work of the previous years to furnish the necessary primary control for all topographic mapping for the immediate future.

The selection of the regions where coöperative work was extended during the past season was governed chiefly by the desirability of completing the sheets previously started, with a view to securing the final mapping of the Adirondack region and all data needed in connection with a more complete knowledge of the water resources of southeastern New York to be available for New York city.

Owing to the late date on which the appropriation became available it was advisable, in order to do economic work, to complete secondary control on several quadrangles. These will be adjusted this winter, and a number of topographers will be sent to the field early in the spring of 1908, to complete the topographic mapping of these sheets as early as possible.

During the season of 1907 surveys were made in Otsego, Delaware, Sullivan, Ulster, Orange, Warren, Hamilton, Saratoga and Steuben counties.

The topographic mapping of the Cooperstown quadrangle was completed and the partial mapping of the Delhi and Stony Creek quadrangles, covering a total area of 363 square miles. Preliminary work was extended so as to complete the secondary control on the Delhi, Neversink, Monticello and Bath quadrangles.

There were 210 miles of primary levels run, and 1,501 miles of secondary levels, in the course of which 13,699 elevations were determined, of which 52 were permanently marked with aluminum tablets. There were 2,994 miles of road traverse, in the course of which 9,913 traverse locations were made.

The output of work during the past season has been below the average, because of the wooded, mountainous and complicated character of the country encountered. There has been and will be on the sheets in progress of mapping a vast amount of foot and tape traverse, making the resulting work slow and expensive.

Progress to Date.

Prior to this season 208 atlas sheets had been surveyed, representing the topography of 38,146 square miles. At the conclusion of the present year, therefore, there had been surveyed and mapped 209 atlas sheets and 2 partial sheets, representing the topography of 38,509 square miles.

Publication of Topographic Sheets.

At the conclusion of the present year there had been engraved and published 235 atlas sheets, covering nearly eight-tenths of the area of the State. Eight of these were engraved and printed during the last year.

Average Expenditure and Progress.

The total outlay since the inception of this work has amounted to about $499,000, of which the State has expended $228,375, or about $26,000 less than the Federal Government. The average cost of mapping to date has been about $13 per square mile. The area of the State remaining unmapped at the close of the last season was 11,024 square miles, so that there still remain 10,661 square miles yet to be mapped, which area will be represented upon 36 atlas sheets. Of this area all but 3,300 square miles is now controlled by primary triangulation and precise leveling executed by the topographic survey, and is now ready for final topographic mapping.

Recommendations.

The topographic survey of the State has made such progress toward completion that, in view of its importance in developing the resources of the State, it should be continued steadily to completion. The total area of the State is 49,170 square miles. Of this there has been mapped 38,509 square miles, leaving only 10,661 square miles to be mapped. About 2,500 square miles are in the Adirondacks and 1,100 square miles in the Catskills, a considerable part being State land.

The topographic maps, resulting from this survey, are of increasing value to the State officials of New York for the construction and maintenance of canals and reservoirs; for the work of the forest reserve board; for water-supply and sanitation; as a basis for soil surveys; and are of inestimable value to the people of the State in connection with the construction of railroads, trolley lines, municipal water-supplies and sanitation. These maps should mean much to the student of all economic questions, especially to the student of geology and physiography, and copies of these maps should be placed in every higher institution of learning in the State.

That this work may be pressed to an early completion, I earnestly recommend the enactment of legislation similar to that contained in the appropriation for sundry supplies for the maintenance of the office of the State Engineer for the past year, calling for a moderate appropriation for the continuance of this work during the year 1908.

Field Work in 1907.

Field work was commenced in May by a party in charge of Mr. C. E. Cooke, topographer, who completed the topographic mapping of the Cooperstown quadrangle, and the traverse and level work on the Delhi, Neversink, Monticello and Bath quadrangles.

Mr. Cooke was assisted a small portion of the time by Mr. Fred Graff, topographic aid, and Mr. W. H. S. Morey, assistant topographer, who sketched part of the Delhi quadrangle. Messrs. Morey and Graff were later transferred to the Stony Creek quadrangle, and with the assistance of Mr. J. I. Gayetty, assistant topographer, mapped about one-third of the Stony Creek quadrangle.

Office Work.

All the atlas sheets completed in 1906, namely, the Goshen, Loon Lake, Port Jervis and Potsdam, were drawn up during the office season of 1906–7 and were turned over to the engraving division for publication. Those remaining in the hands of the engraver are the following: Goshen, Loon Lake, Potsdam and Port Jervis, representing an area of 880 square miles.

Atlas Sheets Engraved and Published.

The following atlas sheets have been completed by the engraving division of the United States Geological Survey since the publication of my last annual report, at which time the total number of sheets engraved was 227, representing an area of 36,709 square miles:

Quadrange	Counties	Area sq. mi.
Eden	Cattaraugus, Erie	219.91
Lake Pleasant	Hamilton	217.28
Massena	St. Lawrence	211.91
Piseco Lake	Hamilton, Herkimer, Fulton	217.28
Port Leyden	Oneida, Lewis	216.40
Sangerfield	Oneida, Madison, Otsego	219.04
Tupper Lake	St. Lawrence, Hamilton, Franklin	214.61
Winfield	Oneida, Herkimer, Otsego	219.04

The total to date is, therefore, 235 atlas sheets, the area represented thereby being 38,469 square miles.

Very respectfully,

GEO. OTIS SMITH,
Director.

REPORT

OF

Records and Gagings

AND

Discharge of Streams

IN THE

STATE OF NEW YORK.

1907.

By ROBERT E. HORTON,
Resident Engineer.

Report on the Gaging of Streams for 1907.

Hon. Frederick Skene, *State Engineer and Surveyor:*

Dear Sir.— The following report contains the results of observations of water-levels along the lines of the Barge canal as well as at gaging stations maintained in coöperation with the United States Geological Survey for the purpose of determining the discharge of streams throughout the state. About ninety gages have been maintained in connection with the Barge canal department, under the immediate direction of Mr. Wm. R. Hill, Special Deputy State Engineer. The mean daily elevations of water-surface at the different stations are published in this report. The discharge is determined at a few of these gaging stations. The methods used being analogous to those employed by the U. S. Geological Survey and hereafter described. As a rule two observations of water-level are made each day and the mean of the two has been used in determining the elevation of water-surface. Stations at Cohoes, Hoosick Falls, Glens Falls, Northville, Schaghticoke, Fort Hunter, Schenectady, and Schoharie Junction, are maintained during the four winter months, December to March, inclusive, by the U. S. Weather Bureau, under the direction of Mr. George T. Todd, Local Forecaster.

The work of stream gaging in connection with the Barge canal was under the general supervision of C. Arthur Poole, First Assistant Engineer, preceding July, 1906, and of Robert E. Horton, Resident Engineer, subsequently.

Most of the stations maintained by this Department are solely for the purpose of recording the water-level, and are not used to determine the discharge. In such cases readings are taken only to the nearest one-tenth foot. The elevations of the gage zeroes and the water-surface elevations deduced from the gage readings are determined with reference to the Barge canal datum.

An annual appropriation for stream gaging in coöperation with the U. S. Geological Survey was made by the State Legislature in each of the years 1900 to 1904 and again in 1906. The results of this work, which was carried on under the joint direction of the Division of Hydrography of the Geological Survey and the State Engineer and Surveyor, have been published in the reports of the State Engineer and Surveyor.

For the period January, 1905, to June 30, 1906, no coöperative fund was available. The gaging stations were, however, continued by the Geological Survey and the results have been included in the report of the State Engineer, thus maintaining the published series of records complete. The coöperative stream gaging was under the immediate direction of Robert E. Horton, Engineer, U. S. Geological Survey, from March, 1900, to June, 1906, and under direction of H. K. Barrows, Engineer, U. S. Geological Survey, subsequent to June, 1906.

The locations of all gaging stations for which records appear in this report are shown on the accompanying maps.

Acknowledgment should be made to the Consolidated Water Co. of Utica, N. Y., for furnishing records of rainfall and flow for Starch Factory, Sylvan Glen and West Canada creeks; to the West Virginia Pulp and Paper Co. for a record of discharge of Hudson river at Mechanicville, N. Y., and to E. A. Fisher, City Engineer, Rochester, N. Y., for gage readings on Genesee river.

METHODS EMPLOYED.

In the establishing of gaging stations no single method of gaging has been employed to the exclusion of others. In many instances two or more methods have been combined at a single station. The principal methods have been the use of dams as weirs in conjunction with records of the flow through turbines or other outlets at mills, and the current-meter method. Gagings by thin-edged weirs and through thin partitions or orifices have been used to some extent in the case of small streams. Surface-floats, rod-floats and the surface-slope methods are also used in cases where other methods cannot be utilized.

The gages at the coöperative stations are chiefly cypress planks with galvanized staple division marks and brass figures. At the Barge canal stations the gages are mostly thin boards with painted or burned division figures and marks. Gages made in sections from enamelled steel strips are also used. These gages are replaced by the field engineers, when they become broken or illegible. Weight-and-chain or weight-and-tape gages of different patterns are used in certain locations.

In determining the discharge at dams and mills the method of procedure is as follows: A profile of the crest of the dam is obtained and is divided into sections, all points in a given section being nearly or precisely at the same elevation. The discharge over each section is computed for a series of crest-depths, ranging from zero to the extreme high-water mark. The summation of these sectional discharge curves furnishes data for a rating table for the entire dam, from which the volume of flow corresponding to any gage height can be read directly. When flash-boards are placed on dams, the conditions are reduced more nearly to those of a standard thin-edged weir, and Francis' well-known formula has been used in computing the discharge. The flow over waste-weirs, auxiliary spillways and flood overflows has been calculated in a manner similar to that used for dams. The amount of flow through head-gates, sluiceways, feeder gates and similar openings has been calculated from the formula for orifices.

In estimating the discharge through turbine water-wheels the results of tests, made at the testing flume of the Holyoke Water Power Company, have been largely depended upon, the mean discharge for each day having been computed from the observed working head, width of opening of speed gates and number of hours each wheel has run. A record of these facts is kept at each of the stations where there are mills in connection with dams.

One difficulty encountered in gaging northern streams results from the accumulation of ice during the winter season. It has been found impossible to keep some dams clear of ice, and an effort is made to keep a record of the length of the clear and unobstructed portion of the dam, from which a correction in the calculated flow can be made.

The method of gaging at dams and mills and the necessary data for the calculation of discharge over weirs or through turbines may be found in the water-supply and irrigation papers of the U. S. Geological Survey, Nos. 150 and 180.[a]

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[a] "Weir Experiments, Coefficients and Formulas" and "Turbine Water Wheel Tests nd Power Tables," by Robert E. Horton.

For current-meter gaging stations a modified form of small Price meter has generally been used.

By courtesy of the owner, arrangements were made during 1907 to rate the current-meters used by the Department at an unused canal slip in the Albany lumber district. For the purpose of rating meters a track 120 feet long was laid alongside the canal slip. The meter to be rated is suspended from an outrigger attached to a car that runs on the track. The car is drawn at a uniform velocity along the track by means of a windlass and tackle. The car is run at various speeds covering the ordinary range of velocities occurring in rivers and canals and the time required and number of revolutions of the meter wheel during each run are recorded. From this data a rating table for the current-meter is prepared, by means of which the velocity of flow of a stream can be deduced from the observed revolutions per second of the meter wheel.

In making gagings of streams the usual method of procedure is to divide the stream into subsections usually of 5 to 10 feet width. The velocity is usually measured at the median point of each subsection by means of the current-meter, the meter wheel usually being submerged six-tenths of the depth of the stream. The revolutions of the meter wheel are recorded for a period of 100 seconds. The time is noted by means of a stop-watch reading to one-fifth second and the period of observation is usually subdivided into two intervals of fifty seconds each. Careful soundings are taken at times when the conditions are favorable and standard cross-sections are prepared therefrom, from which the areas of the subsections can be taken out more accurately than from the individual soundings made in connection with the meter measurements. A simple multiplication of the velocity in each subsection by the cross-sectional area to which it applies gives the rate of discharge for the subsection. A summation of the quantities for the several subsections gives the total measured volume of flow. A river-height gage is established at each current-meter station, from which the stage of the stream is observed once or twice daily. Current-meter measurements of the discharge are made from time to time as opportunity permits. After a sufficient number of discharge measurements have been made they are plotted, using the gage heights of the stream as ordinates and the measured discharges as abscissas. A mean curve is drawn through the plotted points showing the discharge rate in second-feet as a function of the gage reading. By means of this curve the average discharge rate for each day is deduced from the record of the height of the stream kept by the gage reader.

The principal sources of error in gaging streams by the current-meter method are due to the effect of slack, or nearly slack water in any part of the cross-section, or to backwater from dams, from obstructing ice, or from tributaries entering below the gaging station, thereby causing the river stage to rise at times without a proportional increase in the discharge. In accordance with the well-known Kutter formula, the volume of flow in an open channel is a function of the slope, the area of cross-section and the wetted perimeter. When a stream is rising, the slope is usually greater at a given stage of the stream than at the same stage when falling. Northern streams, as a rule, rise rapidly and fall gradually, so that the stream is falling on the majority of days of the year. The error from the above source is small, inasmuch as the discharge varies only as the square root of the slope. The principal difficulty encountered results from the freezing over of streams in winter. The ice serves greatly to increase the wetted perimeter of the measuring section, thereby modifying the rating curve. Whenever practicable, discharge measurements during winter months are made through the ice.

When streams are ice-covered, an opening is kept underneath the gage and the gage reading is taken directly to water-surface level, as in summer. A record is also kept of the ice thickness in inches.

The accuracy of individual current-meter measurements depends chiefly upon the number of the velocity observations and soundings taken in the cross-section. During freshets and at times when ice or debris is floating on the stream's surface, the current-meter cannot be submerged to a six-tenths depth, and readings are taken by holding the meter about one foot below the surface. As a check on the accuracy of the general results and to determine suitable coefficients for the estimation of the mean velocity from that obtained by current-meter, vertical velocity curves are made from time to time.

Owing to rapid fall, with frequent rifts, backwater from dams, obstruction by ice, and other characteristics of New York streams, the difficulty of maintaining continuous gaging records, which will show with sufficient accuracy the discharge rate day by day throughout the year, is very great. This is especially true in streams whose discharge fluctuates between wide limits.

In many cases methods of gaging applicable at low and ordinary stages may not give equally reliable results during freshets; or the reverse may be true, the results being most accurate for high water.

For mill streams, where the water is held back as pond-storage during the dry season, it is impossible to determine the natural regimen of flow of the stream. This is especially true with reference to Sundays and holidays, when mills are not running. If, at any time, the water-wheels are stopped when the water stands below the level of the crest line of the dam, the flow in the stream channel below will be *nil,* or at best, will equal only the leakage of the dam, flumes, or penstocks.

The relation existing between the canals of New York and the streams of the central portion of the state is very complex. Diversion from the head waters of a number of streams for the supply of canals virtually reduces their effective drainage areas. As a result, the summer watershed may be materially less in area and differ widely in its water-yielding characteristics from the region tributary to the stream when the canals are not in operation.

In this connection attention should be called to the maximum daily discharge for each month as given in the following report. This is obtained from the mean of the gaging readings on the day of maximum discharge. As a rule, the discharge at some time in the course of the day was considerably greater than the average for the twenty-four-hour period.

In connection with the gaging stations it is necessary to employ, as observers, persons living near the site selected for the measuring section — those who, as a rule, have had no previous experience in similar work. Their observations are forwarded at the end of each week. As a check on the records so obtained, inspection trips are made at frequent intervals and independent gage readings taken by the hydrographer. The close agreement found in most cases testifies to the intelligent and careful work of the observers.

ST. LAWRENCE RIVER DRAINAGE.

GENERAL FEATURES.

St. Lawrence river receives the flow of a number of New York streams having their sources in a northerly slope of the Adirondacks and fed by the numerous lakes with which the region is dotted. Some of these rivers, as the Grass, Raquette and St. Regis, lie entirely within the United States; others, notably Salmon, Trout, Chateaugay and English rivers, cross the international boundary and flow northward into the St. Lawrence in Canada, as does also Richelieu river, the outlet of Lake Champlain. The following table gives a list of the principal tributaries of the St. Lawrence in the United States, with the areas drained by them:

Drainage areas of St. Lawrence River tributaries in the United States.

	Square miles.		Square miles.
Oswegatchie river	1,609	Salmon river [a]	273
Grass river	637	Trout river [b]	129
Raquette river	1,219	Chateaugay river [b]	199
St. Regis river	910	English river [b]	53
Little Salmon river [a]	103	Lake Champlain [b]	8,187

[a] Above junction near international boundary. [b] Above New York state line.

The St. Lawrence drains, through Lake Champlain, an area of 4,560 square miles in the State of Vermont. This drainage is practically all from Missisquoi, Lamoille and Winooski rivers and Otter creek.

LAKE CHAMPLAIN DRAINAGE BASIN.

DESCRIPTION OF BASIN.

Lake Champlain occupies a long and narrow valley, extending in a north-south direction and forming a part of the boundary between New York and Vermont. The elevation of the lake is about ninety-five feet above tide and the water-surface area is 436 square miles.

The drainage basin is irregular in form, being about seventy-five miles wide from a point opposite Middlebury, Vt., northward to the outlet of the lake at Rouses Point, on the international boundary. South of Middlebury the average width of the basin is about thirty-five miles and the lake itself is very narrow, forming virtually a drowned river.

The tributary region is rugged and mountainous, mostly covered with forest and with little depth of soil except in the stream valleys. The drainage is received almost entirely through large tributaries, there being little direct coast drainage into the lake. The outlet of the lake is Richelieu river, which flows northward from Rouses Point to St. Lawrence river.

In estimating the run-off from this basin in previous years the drainage area has been taken as 7,500 square miles. Maps have recently become available from which the area of the lake and its tributary drainage basin have been more accurately determined, as shown in the following table:

Drainage areas tributary to Lake Champlain.

LOCALITY.	Area.	Total area.
	Square miles.	*Square miles.*
Pike river and adjacent area in Canada	242.0 *a*	
Missisquoi river in Canada	245.0 *b*	
Land area in Canada above outlet		487.0 *a*
Missisquoi river in Vermont	615.0 *b*	
(Total Missisquoi river, 860 square miles.)		
Lamoille river	725.0 *b*	
Winooski river	995.0 *b*	
Otter creek	935.0 *b*	
Eastern coast drainage	534.4 *b*	
Mettawee, Poultney and Castleton rivers in Vermont	376.0 *c*	
Land area in Vermont, except islands		4,180.4
(Castleton river drains 101 square miles.)		
(Poultney river, including Castleton river, drains 265.8 *c* square miles.)		
Wood creek	205.0 *c*	
(Mettawee river, including Wood creek, drains 427.8 *c* square miles.)		
Mettawee and Poultney rivers in New York	112.6 *c*	
Lake George outlet	220.1	
Bouquet river	268.1 *c*	
Ausable river	521.3 *d*	
Little Ausable river	75.1 *d*	
Saranac river	629.6 *d*	
Little Chazy river	63.8 *c*	
Big Chazy river	299.4 *d*	
Western coast drainage	344.6 *d*	
Land area in New York, except islands		2,740.4
Islands	55.2 *e*	55.2
Total land area above outlet		7,463.0
Water-surface in Canada	16.5 *a*	
Water-surface in United States	419.1 *e*	
Total water-surface		435.6
Total drainage above outlet		7,898.6
Richelieu river, Rouses Point to Chambly	310.0 *a*	310.0
Total drainage area above Chambly		8,208.6
Richelieu river, Chambly to mouth	626.3 *a*	626.3
(Total Richelieu river, 936.3 square miles.)		
Total drainage area above mouth		8,834.9

a From maps of Canadian Geological Survey. Scale: 4 miles = 1 inch.
b From United States post-route maps. Scale: 12.5 miles = 1 inch.
c From topographic maps of United States Geological survey. Scale: 1 mile = 1 inch nearly.
d From Bien's Atlas of New York. Scale: 2.5 miles = 1 inch.
e From charts of United States Coast and Geodetic Survey. Scale: 1:40,000.

RICHELIEU RIVER AT FORT MONTGOMERY.

A record of the height of Lake Champlain at Rouses Point, at the head of Richelieu river, the outlet of the lake, has been kept at Fort Montgomery, by the United States Corps of Engineers, beginning in 1875. Through the courtesy of Capt. Harry Taylor, the gage readings taken by William McComb, the fort keeper, at 9 a. m. each day, are reported weekly to the United States Geological Survey.

The depth of the water is taken on a reference mark on the base of the scarp wall, at the north face of bastian B, about three feet from the angle with the east curtain of Fort Montgomery. This reference point is 1.50 feet above an assumed zero, and 1.50 is added to the measured depth to determine the gage reading. In winter the depth as the water rises in a hole in the ice is commonly taken. On windy days the depth is taken in a well within the fort inclosure, by measuring the depth on a flagstone in the bottom of the well.

Elevations at Fort Montgomery.	Feet above tide.
Elevation of reference point on scarp wall of Fort Montgomery *a*	94.998
Elevation of gage zero	93.501
Assumed high water, Lake Champlain	102.611
Assumed low water, Lake Champlain	93.361

The range of rise and fall of the lake is thus seen to be 9.25 feet, representing an available storage volume of about six inches on the entire catchment area above the outlet.

The land drainage area above Rouses Point is 7,463 square miles. The water surface of the lake, 436 square miles, should be added to the land area and the run-off computed for the whole drainage basin, 7,899 square miles.

The daily discharge of the lake has been determined from observations of the depth and discharge over the Chambly dam, thirty-five miles below the head of Richelieu river, made in 1898 by the United States Board on Deep Waterways. A rating table has been derived from the observations at the Chambly dam and the gage readings taken at Rouses Point. The area tributary to the river between Rouses Point and Chambly is 310 square miles, making the total drainage basin above Chambly, 8,200 square miles.

Rating Table for Richelieu River at Fort Montgomery, for 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
0.00	3,300	1.90	9,760	3.80	16,640	5.60	24,620
.10	3,640	2.00	10,100	3.90	17,020	5.70	25,140
.20	3,980	2.10	10,440	4.00	17,400	5.80	25,660
.30	4,320	2.20	10,780	4.10	17,820	5.90	26,180
.40	4,660	2.30	11,120	4.20	18,240	6.00	26,700
.50	5,000	2.40	11,460	4.30	18,660	6.20	27,860
.60	5,340	2.50	11,800	4 40	19,080	6.40	29,020
.70	5,680	2.60	12,160	4.50	19,500	6.60	30,220
.80	6,020	2.70	12,520	4.60	19,940	6.80	31,460
.90	6,360	2.80	12,880	4.70	20,380	7.00	32,700
1.00	6,700	2 90	13,240	4.80	20,820	7.20	34,020
1.10	7,040	3 00	13,600	4.90	21,260	7.40	35,340
1.20	7,380	3.10	13,980	5.00	21,700	7.60	36,700
1.30	7,720	3.20	14,360	5.10	22,180	7.80	38,100
1.40	8,060	3.30	14,740	5.20	22,660	8.00	39,500
1.50	8,400	3.40	15,120	5.30	23,140	8.20	40,980
1.60	8,740	3.50	15,500	5.40	23,620	8.40	42,460
1.70	9,080	3.60	15,880	5.50	24,100	8.60	43,940
1.80	9,420	3.70	16,260				

The above table is based on measurements made at Chambly dam in 1898 by the U. S Board on Deep Waterways.

The lake freezes over in winter, as does also the outlet. It is believed that the discharge is somewhat obstructed by ice and that the estimated discharge for the winter months is in excess of the true amount. Measurements are needed to determine the winter discharge.

Mean Daily Gage Height, in Feet, of Richelieu River at Fort Montgomery.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1.60	2.55	2.05	4.40	5.45	4.20	2.90	2.20	1.10	1.40	2.60	3.00
2	1.60	2.65	2.15	4.80	5.65	4.10	2.95	2.30	1.20	1.45	2.95	2.85
3	1.65	2.60	2.10	4.90	6.05	4.05	2.90	1.70	1.10	1.55	2.80	2.80
4	1.85	2.55	2.00	5.00	5.95	4.15	2.95	1.60	1.25	1.50	2.65	2.85
5	2.15	2.50	1.95	4.85	5.90	4.20	2.95	1.60	1.25	1.55	2.90	2.80
6	2.35	2.40	1.90	4.90	5.80	3.90	2.90	1.60	1.35	1.50	2.80	2.75
7	2.45	2.50	1.85	5.00	5.92	3.75	2.95	2.05	1.45	1.65	2.95	2.75
8	2.50	2.55	1.85	5.20	5.93	3.66	2.90	1.95	1.40	1.90	3.15	2.70
9	2.40	2 60	1.80	4.90	5.95	3.60	2.80	2.00	1.40	1.80	3.30	2.70
10	2.55	2.65	1.75	4.70	5.85	3.55	2.75	2.00	1.50	2.20	3.40	2.75
11	2.50	2.50	1.80	4.80	5.70	3.50	2.70	1.95	1.60	2.20	3.45	3.00
12	2.48	2.45	1.95	4.80	5.65	3.45	2.70	1.95	1.55	2.10	3.50	3.20
13	2.45	2.60	1.90	4.80	5 70	3.35	2.65	1.85	1.50	2.15	3.65	3.50
14	2.50	2.58	1.85	4.70	5.50	3.40	2.65	1.70	1.60	2.15	3.50	3.55
15	2.50	2.30	1.90	4.75	6.00	3.25	2.70	1.75	1.60	2.25	3.55	3.60
16	2.55	2.30	1.80	4.80	5.00	3.23	2.80	1.85	2.05	2.30	3.50	3.65
17	2 55	2.30	1.75	4.75	5.40	3.15	2.70	1.90	1.45	2.30	3.45	3.60
18	2.60	2.20	1.85	4.70	5.30	3.10	2.60	1.60	1.50	2.00	3.55	3.70
19	2.65	......	1.95	4.70	5.25	3.02	2.55	1.60	1.70	2.20	3.40	3.75
20	2.65	2.15	1.95	4.60	5.20	3.00	2.55	1.70	1.60	2.10	3.35	3.80
21	2.60	2.20	2 00	4.55	5.20	2.98	2.40	1.45	1.50	2.10	4.00	3.60
22	2.70	2.18	2.05	4.50	4.95	3.00	2.40	1.40	1.40	2.40	3.30	3.70
23	2.65	2.18	2.15	4.45	4.95	3.00	2.40	1.45	1.60	2.00	3.20	3.65
24	2.60	2.25	2.40	4.40	4.80	2.90	2.45	1.85	1.50	2.00	3.10	3.80
25	2.70	2.20	2.65	4.55	4.75	2.92	2.35	1.40	1.40	2.10	3.00	3.90
26	2.70	2.25	2.85	4.70	4.90	2.95	2.40	1.30	1.30	1.90	3.15	4.00
27	2.70	2.20	2.90	4 90	4 60	2 90	2 20	1.25	1.30	2.50	3.10	4.90
28	2.75	2 15	3.25	5.30	4.55	2 90	2 25	1.20	1 25	1 95	3.05	4.40
29	2.78	......	3.55	5 70	4.33	2.90	2.30	1.15	1.20	2.10	3.00	4.30
30	2.70	.....	4.05	5.20	4 30	2.95	2.25	1.20	1.30	2.20	2.95	4.80
31	2.75	......	4.45	......	4.30	....	2.25	1.10	......	2.40	......	4.45

WOOD CREEK AT WHITEHALL, N. Y.

A record of the stage of Wood creek has been kept since September 19, 1904, when a gage was established above the stone dam of the Champlain silk-mills, by D. B. LaDu of this Department. The gage board is fastened to retaining wall on east side of the creek, near Clinton avenue, about seventy feet above the right-hand end of the dam. The gage is graduated in feet and tenths and is read twice daily by S. H. Pearson. The zero of gage is placed at same elevation as crest of dam, the elevation of which is 107.5.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Wood Creek, at Whitehall, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	113.0	109.2	108.3	110.9	110.6	109.9	110.1	109.4	110.0	111.0	111.1	109.4
2	112.8	109.2	108.6	110.6	110.6	110.1	109.8	109.4	109.3	110.6	111.0	109.4
3	112.1	109.4	108.8	110.2	110.5	110.1	109.5	109.3	108.8	110.1	111.7	109.2
4	112.0	109.4	108.5	110.0	111.3	110.2	109.5	......	109.6	109.8	111.6	109.2
5	113.1	109.2	108.5	110.0	112.3	110.4	109.3	109.6	111.1	110.0	111.2	109.2
6	111.9	109.0	108.4	110.1	111.8	110.4	109.2	109.4	111.3	110.1	111.1	109.3
7	111.8	108.9	108.4	109.9	111.2	110.3	109.3	109.4	111.2	110.1	112.0	109.3
8	111.9	108.8	108.4	109.8	111.0	110.1	109.1	109.4	111.1	110.4	112.5	109.1
9	111.3	108.7	108.6	110.0	110.6	110.2	109.1	109.4	110.6	110.2	112.2	109.1
10	111.0	108.7	108.6	110.0	110.6	110.0	109.1	109.4	110.6	110.3	112.0	111.0
11	110.5	108.6	108.4	110.2	110.6	109.8	109.2	......	110.6	110.2	111.2	113.5
12	110.2	108.6	108.5	110.4	110.4	109.6	109.4	109.4	111.8	110.9	110.5	113.4
13	109.6	108.6	108.6	111.0	110.4	109.6	109.4	108.2	111.6	110.5	110.2	112.0
14	109.4	108.4	109.0	110.8	110.2	109.6	......	106.9	110.6	110.7	110.0	111.4
15	109.2	108.4	110.2	110.7	110.0	109.5	109.4	106.8	109.7	110.5	109.6	111.0
16	109.2	108.7	110.6	110.8	110.1	109.6	109.9	106.9	109.6	110.6	109.5	110.8
17	108.6	108.6	111.3	110.6	110.5	109.5	110.0	107.0	109.6	110.4	109.5	110.4
18	108.9	108.6	111.4	110.2	110.1	109.4	110.1	108.8	109.7	110.4	109.4	110.0
19	109.1	108.6	111.4	109.9	109.9	109.6	110.2	109.2	109.5	110.2	109.4	109.8
20	109.8	108.6	111.0	109.9	109.9	110.0	110.5	108.7	109.4	110.5	109.3	109.7
21	110.2	108.6	110.8	109.8	110.0	109.8	......	108.6	109.4	110.8	109.4	109.6
22	109.7	108.5	111.2	109.7	110.0	109.8	109.4	108.6	109.4	110.5	109.3	109.6
23	109.4	108.4	111.2	109.6	109.8	109.7	109.6	108.7	109.6	110.4	109.2	109.9
24	109.3	108.6	112.2	110.8	109.7	109.6	109.6	108.8	110.3	110.4	109.3	111.9
25	109.3	108.1	111.8	111.4	109.7	109.5	109.7	109.7	110.4	109.8	109.4	111.3
26	109.3	108.1	111.3	111.9	109.7	109.5	109.7	109.3	110.2	110.2	109.6	111.1
27	109.1	108.2	111.0	113.1	110.0	109.6	110.1	108.9	110.2	110.3	109.6	110.6
28	109.1	108.3	111.2	112.5	110.1	109.6	......	108.8	110.7	111.9	109.4	110.4
29	109.1	......	111.8	111.2	110.1	109.4	108.7	108.8	111.2	113.6	109.4	110.3
30	109.0	......	111.6	110.6	110.0	......	108.9	108.8	111.8	113.2	109.4	110.8
31	108.8	......	111.1	......	109 9	......	108.9	108.5	......	112.6	......	111.6

The dam has a flat crest four feet wide, and total length of spillway is eighty-three feet. There is an additional spillway on west side of creek at elevation 113.6, which is seventy-nine feet long.

There are five openings with gates in breast wall; but only two are used at present for supplying the silk-mill; the other three are now used as waste-gates and are seldom open.

A description of the drainage basin of Wood creek and Mettawee river will be found in the State Engineer and Surveyor's Report for 1904, pages 535–547.

A gage has been maintained below the dam at Whitehall by this Department since January 22, 1905, giving a record of the fluctuation of the arm of Lake Champlain into which Wood creek discharges. The stage has been observed twice each day and the appended table shows the mean of these observations reduced to elevation of water-surface. The datum of the gage is 93.00.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of the arm of Lake Champlain, at Whitehall, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	95.9	96.2	95.8	98.5	99.1	97.9	96.4	95.8	95.4	95.8	97.5	97.0
2	96.6	96.2	95.8	98.8	99.0	97.9	96.5	95.8	95.4	95.8	97.4	97.2
3	96.3	96.2	95.8	98.6	99.1	98.0	96.6	95.6	95.5	96.0	96.8	97.0
4	96.1	96.2	95.8	98.6	99.2	97.7	96.6	95.8	95.4	95.8	96.8	97.2
5	96.6	96.2	95.7	98.6	99.6	97.6	96.6	95.7	95.5	95.6	96.8	97.1
6	96.6	96.1	95.7	99.0	99.6	97.6	96.4	95.6	95.5	95.7	96.8	97.1
7	96.5	96.1	95.6	98.6	99.6	97.6	96.4	95.5	95.6	95.9	97.8	97.0
8	96.1	96.2	95.7	98.6	99.8	97.6	96.5	95.4	95.7	96.3	98.3	97.0
9	96.1	96.1	95.7	98.8	99.7	98.1	96.5	95.4	95.7	96.4	98.0	97.0
10	96.0	96.2	95.7	98.7	99.5	98.1	96.5	95.4	95.6	96.5	97.9	97.4
11	96.1	96 2	95.8	98.7	99.8	97.7	96.6	95.4	95.7	96.6	97.7	97.8
12	96.0	96.2	95.8	98.7	99.6	97.6	96.4	95.3	95.8	96.5	97.4	97.8
13	95.8	96.1	95.7	98.8	98.8	97.5	96.6	95.2	95.9	96.6	97.4	97.4
14	95.8	96.1	95.8	98.9	99.6	97.5	96.5	95.4	95.9	96.6	97.2	97.2
15	96.4	96.1	95.9	98.8	99.0	98.0	96.4	95.4	95.7	96.2	97.2	97.2
16	96 4	96 0	96.0	98.5	98.8	97.6	96.5	95.5	95.8	96.1	97.2	97.0
17	96.2	96.1	96.4	98.6	98.9	96.6	96.6	95.4	95.8	96.2	97.5	97.0
18	96.1	96.1	96.5	98.6	98.8	96.6	96.6	95.4	95.7	96.3	97.3	96.9
19	96.1	96.2	96.5	98.5	98.6	96.2	96.6	95.5	95.6	96.2	97.0	96.8
20	96.2	96.1	96.6	98.4	98.8	96.6	96.6	95.5	95.8	96.2	97.0	96.8
21	96 4	96.1	96.6	98.4	98.8	96.7	96.6	95.5	95.8	96.2	96.9	96.6
22	96.3	96.0	96.6	98.6	98.8	96.6	96.6	95.6	95.8	96.2	96.8	96.6
23	96.1	96.1	96.8	98.0	98.7	96.7	96.5	95.5	95.8	96.2	96.8	97.0
24	96.2	96.0	97.0	99.4	98.5	96.6	96.5	95.4	95.6	96.1	96.8	97.2
25	96.1	96.0	97.0	99.2	98.6	96.6	96.4	95.4	95.6	96.3	97.2	97.1
26	96.2	96.0	97.0	99.0	98.3	96.6	96.4	95.3	95.6	96.2	97.0	97.0
27	96.2	96.0	97.2	99.5	98.0	96.6	96.6	95.4	95.7	96.4	97.0	96.9
28	96.4	95.8	97.2	..	98.1	96.5	96.5	95.4	95.8	96.8	96.9	96.9
29	96.2	......	97.6	..	98.3	96.5	95.9	95.4	96.0	98.5	96.8	97.0
30	96.1	......	97.7	..	98.7		95.8	95.4	96.3	98.4	96.9	97.2
31	96.1	......	97.8	..	98.2		95.8	95.4	.....	97.3	......	97.3

SARANAC RIVER.

DESCRIPTION.

Saranac river rises in southeastern Franklin county, and flows northeastward to a point near Cadyville and thence eastward into Lake Champlain at Plattsburg. The southern boundary of the basin is the Ampersand mountain range, and the stream drains the north slope of the most elevated region of the State of New

York. About 16.2 per cent of the upper drainage area is water-surface. The areas tributary to the river are shown in the following table:

Drainage areas of Saranac River. [a]

LOCATION.	Area.	Total area.
	Square miles.	*Square miles.*
Above Saranac lake State dam	....	157.5
Above Saranac Lake village	44.9	202.4
Above Franklin Falls	104.3	306.7
North Branch Saranac river	136.6	136.6
At junction North branch	....	498.8
Above High Falls	19.6	518.4
Above Cadyville	74.6	593.0
Above Kent Falls	2.9	595.9
Above Morrisonville	2.0	597.9
Above Lozier dam	26.1	624.0
Above mouth	5.6	629.6

[a] From Bien's Atlas of New York.

The results of gagings of Saranac river at a station formerly maintained at Saranac lake are given in the report of the State Engineer and Surveyor for 1903, Supplement, pages 71–74.

In 1854 a timber dam was built below lower Saranac lake for the purpose of flooding logs. In 1899–1901 a masonry dam and lock were erected by the State at this point, raising the water-level of lower Saranac lake, eighteen inches.

SARANAC RIVER NEAR PLATTSBURG, N. Y.

A gaging station was established by Robert E. Horton at the dam of the Plattsburg Light, Heat and Power Company, six miles above Plattsburg, March 17, 1903. This station is maintained by the U. S. Geological Survey in coöperation with this Department.

The record includes the flow over a straight spillway crest 171.25 feet in length, the discharge through two five-foot waste gates when open, and the discharge through five thirty-three-inch Victor turbines controlled by automatic governors. The gages were read and the record furnished by A. E. Hare until January, 1907; since then the record has been furnished by the company. The record for 1907 is withheld pending the acquisition of additional data. Experiments have been made at Cornell University hydraulic laboratory on a model of the ogee section of the dam, from which coefficients have been derived for the calculation of the discharge.

LAKE GEORGE.

DESCRIPTION.

Lake George occupies a valley extending in a northeast-southwest direction, between Schroon river on the west and the south arm of Lake Champlain on the east. The lake has an average width of from one to two miles, contains numerous islands, and has precipitous, forest-covered slopes reaching to the shore on either side. The inflow is through small tributaries in deep-cut gullies on the side slopes. The lake lies at an elevation of 323 feet above tide, and the adjacent hills rise to elevations ranging between 1,200 and 2,000 feet within one to two miles of the lake margin. Aside from the main lake there is but little water-surface within the drainage basin. The total area tributary to the lake above its outlet is 220 square miles, 20.5 per cent (forty-five square miles) of which is water-surface.[a]

The outlet of Lake George is a stream three miles long, entering Lake Champlain at Fort Ticonderoga. This stream leaves Lake George at a distance of 1.5 miles from Lake Champlain and at an elevation 220 feet greater. It makes an abrupt bend, in which occur, naturally, several cascades over rock. The water-power is at present developed by dams located successively along the stream, the uppermost dam controlling the outflow from Lake George.

LAKE GEORGE OUTLET AT TICONDEROGA, N. Y.

A gaging station was established by Robert E. Horton, August 24, 1904, at the "B" mill of the International Paper Company at Ticonderoga. This gaging station was maintained by the U. S. Geological Survey in coöperation with this Department.

This is the second dam below Lake George. The dam is of masonry, is without leakage, and has a horizontal crest six feet in breadth and substantially level.

Observations of the depth on the crest of the dam and in the tail-race were taken four times each day by C. E. Carpenter. The discharge through the turbines was determined from current-meter measurements in the tail-race below the pulp mill. During 1906 changes were made in the tail-race, which make it impracticable to determine the flow, and the station was discontinued July 1, 1907.

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[a] The drainage basin of Lake George is shown on the Glens Falls, Bolton, Whitehall, Ticonderoga and adjacent topographic atlas sheets of the United States Geological Survey.

OSWEGATCHIE RIVER.

DESCRIPTION.

Oswegatchie river has its source in the region of lakes and timbered swamps in the southern part of St. Lawrence county. The largest of the lakes is Cranberry lake, which affords valuable storage to water-power users on its outlet, East branch of Oswegatchie river. East and west branches flow in a general northwesterly direction and unite near Talcville. From Gouverneur to Oxbow the river flows southwestward; it then turns sharply and flows northeastward to Rensselaer Falls, turns again to the northwest, receives the outlet of Black lake at Galilee, and finally enters the St. Lawrence at Ogdensburg.

OSWEGATCHIE RIVER NEAR OGDENSBURG, N. Y.

The gaging station was established May 16, 1903, by Robert E. Horton. It is located at Eel weir bridge, just below the junction of Oswegatchie river and Black lake outlet. This gaging station is maintained by the U. S. Geological Survey in coöperation with this Department.

The channel is in rock and is partly artificial, rock underneath the bridge having been removed by blasting to increase the bridge opening. The bridge consists of two spans, the right being 129.6 feet long and the left 130.1 feet.

Discharge measurements are made from the down-stream side of the bridge. The initial point for soundings is the top of the face of the right abutment, down-stream side.

A standard chain gage, which is observed twice daily by Joseph H. La Rue, is attached to the ironwork of the bridge on the up-stream side of the right-hand span. The bench-mark is a square chisel draft on the up-stream side of the right-hand abutment; elevation, 16.72 feet above gage datum.

Mean Daily Gage Height, in Feet, of Oswegatchie River near Ogdensburg, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	5.3	5.6	4.5	8.5	5.8	5.4	4.9	4.5	4.4	4.8	5.1	5.5
2	5.6	5.4	4.6	8.5	6.1	5.3	4.9	4.5	4.4	4.8	5.2	5.4
3	6.4	5.4	4.6	8.2	6 3	5.2	4.9	4.5	4.4	4.9	5.4	5.4
4	6.4	5.4	4.6	8.1	6.4	5.1	4.8	4.5	4.4	5.0	5.4	5.3
5	6.7	5.3	4.8	7.7	6.8	5.2	4.8	4.5	4.5	5.0	5.4	5.3
6	7.4	5.1	4.8	7.3	6.9	5.2	4.8	4.5	4.5	5.1	5.4	5.3
7	7.4	5.0	4.9	7.1	7.3	5.2	4.8	4.5	4.5	5.1	5.8	5.3
8	7.5	4.9	4.8	7.0	7.2	5.3	4.9	4.5	4.6	5.1	6.4	5.2
9	7.5	4.9	4.9	6.8	7 3	5.2	4.9	4.5	4.5	5.1	6.8	5.2
10	7.5	4.9	4.8	6.7	7.4	5 0	4.9	4.5	4.6	5.3	7.0	5.2
11	7.3	4.9	4.8	6.7	7.1	5.0	4.9	4.5	4.6	5.3	7.2	5.4
12	7.0	4.8	4.8	6.7	6.9	5.0	4.9	4.5	4.8	5.4	7.3	5.6
13	6.8	4.9	4.9	6.5	6.6	5.0	4.8	4.5	4.8	5.4	7.3	6.3
14	6.5	4.7	4.9	6.4	6.3	5.0	4.8	4.4	4.8	5.5	7.2	6.3
15	6.6	4.7	4.9	6.2	6.3	4.8	4.7	4.4	4.8	5.5	7.0	6.1
16	6.5	4.6	5.0	6.1	6.2	4.9	4.8	4.4	4.8	5.6	6.8	6.1
17	6.4	4.6	5.2	6.1	6.0	4.9	4.7	4.4	4.8	5.6	6.6	5.9
18	6.4	4.6	5.4	6.0	6.0	4.9	4.6	4.4	4.8	5.4	6.4	6.0
19	6.2	4.6	5.5	5.9	5 8	4.8	4.6	4.4	4.8	5.4	6.2	6.1
20	6.2	4.6	5.7	5.8	5 8	4.8	4.6	4.4	4.8	5.3	6.2	5.8
21	6.6	4.7	5.9	5.7	5.6	4.7	4 6	4.4	4.7	5.3	6.2	5.7
22	7.1	4.7	6.1	5.6	5.5	4.7	4.6	4.4	4.7	5.3	6.1	5.8
23	7.5	4.7	6.3	5.5	5.4	4.7	4.5	4.4	4.7	5.2	6.0	5.8
24	7.1	4.6	6.6	5.3	5.3	4.7	4.6	4.4	4.7	5 3	5.8	5.9
25	6.9	4.6	7.1	5.3	5.3	4.8	4.6	4.4	4.7	5.3	5.8	6.2
26	6.9	4.6	7.3	5.3	5.3	4.8	4 5	4.4	4.7	5.2	5.8	6.4
27	6.6	4.6	7.8	5 3	5.3	4.8	4.5	4 4	4.7	5.2	5.7	6.6
28	6.4	4.6	8.1	5.5	5.3	4.8	4.5	4.4	4.7	5.1	5.6	6.9
29	6.2	......	8.2	5.5	5.2	4.8	4.5	4.4	4.7	5.1	5.5	7.7
30	5.9	......	8.5	5.6	5.6	4.8	4.5	4.4	4.9	5.1	5.5	7.9
31	5.7	......	8.5	......	5.5	......	4.5	4.4	......	5.1	......	8.0

Current-meter Discharge Measurements of Oswegatchie River near Ogdensburg, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1907.		*Feet.*	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
Mar. 9 *a*	C. C. Covert..................	4.90	222	370	3.02	1,120

a Ice near shore and around piers; river open below for 2 miles until backwater from dam at Ogdensburg interferes.

Rating Table for Oswegatchie River near Ogdensburg, N. Y.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
4.40	590	5.50	2,180	6.60	5,185	8.40	10,570
4.50	680	5.60	2,400	6.70	5,480	8.60	11,180
4.60	780	5.70	2,640	6.80	5,775	8.80	11,790
4.70	890	5.80	2,890	6.90	6,070	9.00	12,400
4.80	1,010	5.90	3,160	7.00	6,365	9.20	13,020
4.90	1,140	6.00	3,440	7.20	6,955	9.40	13,640
5.00	1,280	6.10	3,730	7.40	7,550	9.60	14,260
5.10	1,440	6.20	4,020	7.60	8,150	9.80	14,880
5.20	1,610	6.30	4,310	7.80	8,750	10.00	15,500
5.30	1,790	6.40	4,600	8.00	9,350	......	....
5.40	1,980	6.50	4,890	8.20	9,960	......	....

The above table is applicable only for open channel conditions. It is based upon 19 discharge measurements made during 1903 to 1906. It is fairly well defined.

Mean Daily Discharge, Second-feet, of Oswegatchie River near Ogdensburg, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1,790	2,400	680	10,880	2,890	1,980	1,140	680	590	1,010	1,440	2,180
2	2,400	1,980	780	10,880	3,730	1,790	1,140	680	590	1,010	1,610	1,930
3	4,600	1,980	780	9,960	4,310	1,610	1,140	680	590	1,140	1,980	1,980
4	4,600	1,980	780	9,660	4,600	1,440	1,010	680	590	1,280	1,980	1,790
5	5,480	1,790	1,010	8,450	5,780	1,610	1,010	680	680	1,280	1,980	1,790
6	7,550	1,440	1,010	7,250	6,070	1,610	1,010	680	680	1,440	1,980	1,790
7	7,550	1,280	1,140	6,660	7,250	1,610	1,010	680	680	1,440	2,890	1,790
8	7,850	1,140	1,010	6,360	6,960	1,790	1,140	680	780	1,440	4,600	1,610
9	7,850	1,140	1,140	5,780	7,250	1,610	1,140	680	680	1,440	5,780	1,610
10	7,850	1,140	1,010	5,480	7,550	1,280	1,140	680	780	1,790	6,360	1,610
11	7,250	1,140	1,010	5,480	6,660	1,280	1,140	680	780	1,790	6,960	1,980
12	6,360	1,010	1,010	5,480	6,070	1,280	1,140	680	1,010	1,980	7,250	2,400
13	5,780	1,140	1,140	4,890	5,180	1,280	1,010	680	1,010	1,980	7,250	4,310
14	4,890	890	1,140	4,600	4,310	1,280	1,010	590	1,010	2,180	6,960	4,310
15	5,180	890	1,140	4,020	4,310	1,010	890	590	1,010	2,180	6,360	3,730
16	4,890	780	1,280	3,730	4,020	1,140	1,010	590	1,010	2,400	5,780	3,730
17	4,600	780	1,610	3,730	3,440	1,140	890	590	1,010	2,400	5,180	3,160
18	4,600	780	1,980	3,440	3,440	1,140	780	590	1,010	1,980	4,600	3,440
19	4,020	780	2,180	3,160	2,890	1,010	780	590	1,010	1,980	4,020	3,730
20	4,020	780	2,640	2,890	2,890	1,010	780	590	1,010	1,790	4,020	2,890
21	5,180	890	3,160	2,640	2,400	890	780	590	890	1,790	4,020	2,640
22	6,660	890	3,730	2,400	2,180	890	780	590	890	1,790	3,730	2,890
23	7,850	890	4,310	2,180	1,980	890	680	590	890	1,610	3,440	2,890
24	6,660	780	5,180	1,790	1,790	890	780	590	890	1,790	2,890	3,160
25	6,070	780	6,660	1,790	1,790	1,010	780	590	890	1,790	2,890	4,020
26	6,070	780	7,250	1,790	1,790	1,010	680	590	890	1,610	2,890	4,600
27	5,180	780	8,750	1,790	1,790	1,010	680	590	890	1,610	2,640	5,180
28	4,600	780	9,660	2,180	1,790	1,010	680	590	890	1,440	2,400	6,070
29	4,020	......	9,960	2,180	1,610	1,010	680	590	890	1,440	2,180	8,450
30	3,160	......	10,880	2,400	2,400	1,010	680	590	890	1,440	2,180	9,050
31	2,640	......	10,880	......	2,180	......	680	590	......	1,440	......	9,350
Mean	5,390	1,140	3,380	4,800	3,910	1,250	909	628	847	1,670	3,940	3,550

Monthly Discharge of Oswegatchie River near Ogdensburg, N. Y.

[Drainage area, 1,580 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	7,850	1,790	5,390	3.41	3.92
February	2,400	780	1,140	0.722	0.751
March	10,880	680	3,380	2.14	2.46
April	10,880	1,790	4,800	3.04	3.40
May	7,550	1,610	3,910	2.48	2.85
June	1,980	890	1,250	0.791	0.886
July	1,140	680	909	0.575	0.661
August	680	590	628	0.398	0.458
September	1,010	590	847	0.536	0.600
October	2,400	1,010	1,670	1.06	1.22
November	7,250	1,440	3,940	2.49	2.79
December	9,350	1,610	3,550	2.25	2.59

RAQUETTE RIVER.

DESCRIPTION.

Raquette river drains a long, narrow basin extending from northern Hamilton county to St. Lawrence river. Its sources are on an elevated plateau, dotted with mountains interspersed with lakes. The region is timbered, but numerous marsh and swamp areas exist, many of which are on the divide and feed streams flowing in opposite directions. The lakes of the head waters afford ample opportunities for storage development.

Observations at the dam of the Hannawa Falls Power Company were taken from September, 1902, to March 31, 1903. The discharge has not been computed.

The results of gagings at a station formerly maintained on Raquette river at South Colton, N. Y., may be found in the report of the State Engineer and Surveyor for 1904, pages 533–4.

RAQUETTE RIVER AT MASSENA SPRINGS, N. Y.

A gaging station was established by Robert E. Horton at the highway bridge at Massena Springs, September 21, 1903. Observations were continued until October 17, 1903, when the station was temporarily abandoned. It was resumed April 9, 1904, and has since been maintained by the U. S. Geological Survey in coöperation with this Department.

The channel is straight for 300 feet above and 1,000 feet below the bridge, which consists of a single span of 167.5 feet. The banks are not subject to overflow. The current is swift and uniform.

Discharge measurements are made from the down-stream side of the Massena Springs highway bridge. The initial point for soundings is the top of the right bridge abutment on the upstream side of the bridge.

The gage, which was read during 1906 by G. L. Buffum, consists of a vertical scale attached to the right abutment on the upstream side of the bridge. The bench-mark is a cross painted on the outside down-stream corner of the foundation adjacent to the sulphur springs; elevation above gage datum, 12.21 feet. The Sunday flow of this stream, like many others in this state, is often held back during the low-water season, while ponds at mills above are being refilled. Where there is extensive pondage of this character, the resultant effect may be shown in the stream for several days.

Mean Daily Gage Height, in Feet, of Raquette River at Massena Springs, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	6.3	5.6	4.0	10.2	6.5	4.8	3.9	2.5	1.8	2.6	3.9	4.3
2	7.1	5.4	4.1	9.4	6.4	4.0	4.1	2.0	2.0	2.7	3.9	7.4
3	6.9	5.4	4.5	8.4	6.1	4.7	3.9	1.6	1.9	2.8	3.9	7.4
4	6.8	5.3	4.4	7.6	6.0	4.3	3.1	1.8	1.9	2.8	3.9	7.5
5	7.1	5.6	4.5	6.6	7.8	4.1	2.7	2.3	2.1	3.0	4.0	7.5
6	7.9	4.9	5.2	5.8	7.8	4.1	3.4	2.4	2.1	1.9	4.0	6.6
7	7.5	4.4	4.9	5.6	7.2	4.2	3.0	2.7	1.9	2.4	5.5	6.4
8	6.9	5.0	4.4	6.5	6.9	4.4	2.4	2.5	1.7	2.6	5.5	5.6
9	6.4	5.1	5.0	6.1	6.7	4.2	3.5	2.1	1.8	3.2	5.5	5.6
10	6.5	5.0	4.0	6.0	6.7	4.4	3.0	2.4	2.1	3.7	5.4	5.4
11	6.2	4.9	4.1	5.7	6.7	4.4	3.1	2.3	1.9	4.1	5.2	5.4
12	6.2	4.9	4.4	6.2	6.2	3.6	3.3	2.0	1.8	4.3	5.0	5.1
13	6.2	4.9	4.5	5.9	6.4	3.4	3.3	2.0	1.8	4.3	5.0	4.9
14	5.6	3.8	4.0	5.5	6.5	3.6	2.6	2.0	1.8	4.4	4.8	5.0
15	6.3	5.0	5.1	5.7	6.5	3.3	3.1	1.8	1.7	4.7	4.8	5.6
16	5.9	4.9	5.2	5.6	6.1	3.0	3.7	1.7	1.7	4.6	4.6	6.5
17	5.6	4.7	4.5	4.7	5.8	3.2	3.4	1.7	1.6	4.4	4.7	7.6
18	5.5	4.5	7.2	4.9	5.9	3.0	3.5	1.8	1.5	4.3	4.9	7.7
19	5.5	4.6	7.0	4.8	5.8	2.7	3.5	2.0	1.5	4.2	4.6	7.7
20	7.6	4.7	6.8	4.7	5.6	2.9	3.2	1.8	1.5	4.2	4.5	7.7
21	9.1	3.9	5.7	3.9	6.5	3.2	2.7	2.1	2.3	4.3	4.5	7.4
22	6.6	4.7	5.5	4.0	6.0	3.3	3.1	2.1	2.5	4.2	4.5	7.4
23	6.4	4.7	8.0	3.8	5.8	2.8	3.5	1.8	2.4	4.0	4.4	7.5
24	6.2	4.1	9.2	3.7	5.6	3.3	3.2	1.6	2.4	4.0	4.2	7.7
25	6.1	3.9	8.0	4.3	5.5	3.5	3.1	1.7	2.3	3.8	4.0	7.7
26	5.8	4.6	8.0	4.7	5.2	3.1	3.3	2.1	2.3	3.8	3.9	7.8
27	5.5	4.7	7.4	4.8	4.9	3.0	3.3	1.9	2.4	3.9	3.9	7.8
28	4.8	4.0	8.7	4.3	5.3	3.4	2.5	2.0	2.4	3.9	4.0	10.1
29	6.0	......	12.0	4.6	5.4	3.3	2.8	2.0	1.7	3.7	4.0	10.8
30	5.5	......	11.0	4.4	5.2	2.9	2.9	1.8	2.6	3.7	4.0	10.8
31	5.5	......	11.4	......	4.7	......	2.9	1.6	......	3.9	......	8.6

Current-meter Discharge Measurements of Raquette River at Massena Springs, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1907.		*Feet.*	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
Mar. 8 *a*..	C. C. Covert	4.15	171	332	1.67	556

a Gage height to top of ice, 4.45; gage height to bottom of ice, 1.45; average thickness of ice, 2.59; average depth of ice below water-surface, 2.03.

Rating Table for Raquette River at Massena Springs, N. Y., for 1907. a

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1.00	190	2.60	1,005	4.20	2,310	6.60	4,620
1.10	226	2.70	1,070	4.30	2,400	6.80	4,820
1.20	265	2.80	1,140	4.40	2,490	7.00	5,020
1.30	310	2.90	1,210	4.50	2,580	7.20	5,220
1.40	355	3.00	1,285	4.60	2,675	7.40	5,420
1.50	400	3.10	1,360	4.70	2,770	7.60	5,620
1.60	445	3.20	1,435	4.80	2,865	7.80	5,820
1.70	495	3.30	1,515	4.90	2,960	8.00	6,020
1.80	545	3.40	1,595	5.00	3,055	8.20	6,220
1.90	595	3.50	1,680	5.20	3,245	8.40	6,420
2.00	650	3.60	1,770	5.40	3,435	8.60	6,620
2.10	705	3.70	1,860	5.60	3,625	8.80	6,820
2.20	760	3.80	1,950	5.80	3,820	9.00	7,020
2.30	820	3.90	2,040	6.00	4,020	10.00	8,020
2.40	880	4.00	2,130	6.20	4,220	11.00	9,020
2.50	940	4.10	2,220	6.40	4,420		

The above table is applicable only for open-channel conditions. It is based on discharge measurements made during 1904–6. It is well defined between gage heights 0.1 foot and 1.9 feet; also between 5 feet and 6 feet.

a The above rating is the same as that used for 1904–6; except that the gage heights have been increased 1.00 foot to allow for setting the datum of the gage 1.00 foot lower.

Mean Daily Discharge, Second-feet, of Raquette River at Massena Springs, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.	*a*	*a*	*a*									*a*
1				8,220	4,520	2,860	2,040	940	545	1,000	2,040	
2				7,420	4,420	2,130	2,220	650	650	1,070	2,040	
3				6,420	4,120	2,770	2,040	445	595	1,140	2,040	
4				5,620	4,020	2,400	1,360	545	595	1,140	2,040	
5				4,620	5,820	2,220	1,070	820	705	1,280	2,130	
6				3,820	5,820	2,220	1,600	880	705	595	2,130	
7				3,620	5,220	2,310	1,280	1,070	595	880	3,530	
8				4,520	4,920	2,490	880	940	495	1,000	3,530	
9				4,120	4,720	2,310	1,680	705	545	1,440	3,530	
10				4,020	4,720	2,490	1,280	880	705	1,860	3,440	
11				3,720	4,720	2,490	1,360	820	595	2,220	3,240	
12				4,220	4,220	1,770	1,520	650	545	2,400	3,060	
13				3,920	4,420	1,600	1,520	650	545	2,400	3,060	
14				3,530	4,520	1,770	1,000	650	545	2,490	2,860	
15				3,720	4,520	1,520	1,360	545	495	2,770	2,860	
16				3,620	4,120	1,280	1,860	495	495	2,680	2,680	
17				2,770	3,820	1,440	1,600	495	445	2,490	2,770	
18				2,960	3,920	1,280	1,680	545	400	2,400	2,960	
19				2,860	3,820	1,070	1,680	650	400	2,310	2,680	
20				2,770	3,620	1,210	1,440	545	400	2,310	2,580	
21				2,040	4,520	1,440	1,070	705	820	2,400	2,580	
22				2,130	4,020	1,520	1,360	705	940	2,310	2,580	
23				1,950	3,820	1,140	1,680	545	880	2,130	2,490	
24				1,860	3,620	1,520	1,440	445	880	2,130	2,310	
25				2,400	3,530	1,680	1,360	495	820	1,950	2,130	
26				2,770	3,240	1,360	1,520	705	820	1,950	2,040	
27				2,860	2,960	1,280	1,520	595	880	2,040	2,040	
28				2,400	3,340	1,600	940	650	880	2,040	2,130	
29				2,680	3,440	1,520	1,140	650	495	1,860	2,130	
30				2,490	3,240	1,210	1,210	545	1,000	1,860	2,130	
31					2,770		1,210	445		2,040		
Mean				3,670	4,140	1,800	1,450	658	647	1,890	2,590	

a Ice obstructions.

Monthly Discharge of Raquette River at Massena Springs, N. Y.

[Drainage area, 1,170 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
April	8,220	1,860	3,670	3.14	3.52
May	5,820	2,770	4,140	3.54	4.07
June	2,860	1,070	1,800	1.54	1.72
July	2,220	880	1,450	1.20	1.38
August	1,070	445	658	0.562	0.646
September	1,000	400	647	0.553	0.636
October	2,770	595	1,890	1.62	1.86
November	3,530	2,040	2,590	2.21	2.48

LAKE ONTARIO DRAINAGE.

GENERAL FEATURES.

In the northwestern part of the state of New York, between Niagara and St. Lawrence rivers, is an area aggregating about 12,400 square miles drained by streams which flow into Lake Ontario. The divide which controls this drainage is very irregular. Extending to the south and southeast from Fort Niagara, it passes around the head waters of the Genesee a short distance into Pennsylvania; thence reëntering New York it runs southward and eastward from the interior group of lakes, turns to the north, encircles the sources of Black river, turns again to the west, and descends to the lake. The country thus included is level or gently undulating in the counties bordering the lake, but farther south it becomes more rolling, and a series of ridges, gradually increasing in height, stretch down between Cayuga and Seneca, and their companion lakes, finally becoming merged with the elevated, broken country forming the principal divide, the abrupt slopes of which attain altitudes of from 2,000 to 2,500 feet about the head waters of the Genesee.

The easterly, or Black river lobe of the drainage basin receives the run-off from the southwestern slope of the Adirondack mountains — largely a rugged and forest-covered area — receiving heavy precipitation, especially in the winter.

Drift deposits are generally scattered over the section, and the soil is in part derived from that source and in part from the disintegration of native rocks.

The principal streams of the area are the Oswego, formed by the union of Seneca and Oneida rivers, which drain the chain of lakes in central New York, the Genesee, Salmon and Black rivers.

BLACK RIVER DRAINAGE BASIN.

BLACK RIVER.

DESCRIPTION.

Black river rises in the western part of Hamilton county, N. Y., flows southwestward across Herkimer county into Oneida county, turns near Forestport and runs somewhat west of north through Lewis county to eastern Jefferson county, and then flows westward to Black River bay, at the eastern extremity of Lake Ontario. The upper part of the basin is very rugged and mountainous and contains a large number of lakes.

The regimen of the river is controlled by storage on its upper tributaries, including Beaver river at Beaver, a series of reservoirs at the head waters of Moose river, and additional reservoirs at Forestport and on the head waters of the main river.

Water is diverted from Black river through Forestport feeder to supply the Black River canal at Boonville. A portion of this diverted water flows northward from Boonville and enters Black river again at Lyons Falls; the remainder flows southward through the Black River canal and enters the Erie canal at Rome.

The results of gagings of this division may be found in the State Engineer's Report for 1906, Supplement, page 36, and also on pages 597–598 of this report.

The results of gagings at a station formerly maintained on the Black river at Huntingtonville, N. Y., may be found in the report of the State Engineer and Surveyor for 1902, Supplement, pages 31–37.

BLACK RIVER NEAR FELTS MILLS, N. Y.

This station was established by Robert E. Horton, August 29, 1902, and has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the dam of the Harmon Paper Company, formerly owned by the Black River Traction Company, near the village of Felts Mills. The dam is nine miles up-stream from Watertown and seven miles up-stream from the old Huntingtonville gaging station on this stream. The drainage area is estimated at 1,851 square miles, or 37.5 square miles less than at Huntingtonville. The intervening area is mainly drained by two small streams, Townsend and Rutland Hollow creeks.

The dam is of sawed timber, rests on limestone foundation, and is very nearly water-tight. It has a slope on the up-stream face of 2.88 horizontal to 1 vertical. The crest is protected by boiler plate and the down-stream face is vertical, giving a free overfall. The main crest is 380.6 feet long. There are two additional sections on the right-hand side, one 14.1 feet long and the other 17.9

feet. A similarly constructed dam, 117 feet long, at the left bank serves as an auxiliary spillway and as a head-race wall.

The gage, which was read twice daily during 1906, at 7 a. m. and 6 p. m., is attached vertically to a crib at the left-hand side of the stream above the mill. Correction is made to the gage readings for velocity of approach during high water. The discharge over the spillways has been calculated by means of the weir formula, using coefficients derived from experiments of the United States Geological Survey for a dam of similar cross-section.

A wood pulp mill has been constructed adjacent to this dam and was in operation during 1907. The mill contains four 72-inch and one 45-inch Smith-McCormick turbines. A record is kept of the hours run, and gate opening of each wheel, as well as of the head under which they operate.

The results obtained at this station in previous years may be found in the report of the State Engineer and Surveyor for 1906, Supplement, pages 36–40.

Mean Daily Discharge, Second-feet, of Black River near Felts Mills, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.	a	a	a									
1	......	......	......	16,755	8,769	2,531	2,282	790	*298	1,274	4,121	*1,265
2	......	......	......	13,795	8,965	*2,676	2,116	882	442	2,294	2,690	2,116
3	......	......	......	10,866	8,769	3,229	2,583	761	790	2,151	*2,877	1,673
4	......	......	......	7,499	8,769	2,157	2,044	*752	731	2,022	6,413	1,598
5	......	......	......	7,143	*12,636	1,839	2,859	874	1,373	3,185	6,757	1,780
6	......	......	......	6,160	10,171	1,913	1,443	836	2,706	*2,848	6,929	1,698
7	......	......	......	*5,988	9,785	3,245	*1,265	1,054	1,987	5,733	8,085	1,618
8	......	......	......	5,840	9,369	3,375	1,141	983	*2,381	5,695	9,701	*1,476
9	......	......	......	3,931	8,573	*3,368	1,141	914	1,499	6,305	9,733	2,510
10	......	......	......	3,807	8,769	3,083	1,329	2,226	1,488	6,585	*8,560	4,429
11	......	......	......	3,683	6,489	2,687	1,084	*723	1,427	6,069	8,360	7,889
12	......	......	......	3,683	*4,760	2,441	817	896	1,941	5,967	7,481	8,532
13	......	......	......	3,735	7,765	2,116	1,730	1,103	2,743	*6,200	5,749	8,254
14	......	......	......	*3,960	4,133	1,994	*1,312	817	2,855	4,529	4,825	7,563
15	......	......	......	4,303	3,846	1,685	1,864	783	*3,063	3,985	4,121	*7,728
16	......	......	......	4,725	3,289	*1,360	1,285	596	1,607	3,229	3,547	4,529
17	......	......	......	5,971	3,637	1,242	868	1,412	1,387	2,743	*3,960	4,257
18	......	......	......	5,646	4,009	986	1,255	*350	1,692	2,394	3,431	4,121
19	......	......	......	5,651	*2,676	1,248	868	576	1,181	2,246	3,005	3,725
20	......	......	......	5,036	4,615	1,535	1,126	596	1,226	*2,299	3,005	3,353
21	......	......	......	*2,168	3,003	1,548	*804	609	1,080	1,873	2,855	3,175
22	......	......	......	5,704	2,808	2,354	1,539	625	*1,005	1,873	3,061	*2,676
23	......	......	......	4,948	2,707	*1,472	868	715	946	1,954	3,423	3,592
24	......	......	......	5,022	2,710	1,618	1,164	1,138	1,415	2,075	*2,812	4,521
25	......	......	......	3,933	2,644	1,537	1,346	*152	1,320	1,994	3,398	7,324
26	......	......	......	5,581	*2,292	1,383	868	10	1,820	1,599	3,118	9,069
27	......	......	......	6,787	2,294	980	802	547	1,901	*2,187	3,006	9,037
28	......	......	......	*8,144	2,687	1,171	*980	635	1,941	2,536	2,416	10,915
29	......	......	......	9,267	3,023	522	1,498	670	*3,018	4,529	3,118	*11,092
30	......	......	......	8,235	2,634	*1,123	1,255	614	2,104	4,825	2,938	10,089
31	......	......	......	......	2,341	......	859	601	......	4,529	......	10,309
Mean	......	......	......	6,266	5,450	1,947	1,368	782	1,646	3,475	4,783	5,223

*, Sundays.
a Ice obstruction.

Monthly Discharge of Black River near Felts Mills, N. Y.

[Drainage area, 1,851 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
April	16,755	2,168	6,266	3.38	3.78
May	12,636	2,292	5,450	2.94	3.38
June	3,375	522	1,947	1.05	1.18
July	2,859	804	1,368	0.739	0.850
August	2,226	10	782	0.422	0.485
September	3,063	298	1,646	0.889	0.996
October	6,585	1,274	3,475	1.88	2.16
November	9,733	2,690	4,783	2.58	2.89
December	11,092	1,265	5,223	2.82	3.24

MOOSE RIVER.

DESCRIPTION.

Moose river is tributary to Black river at Lyons Falls, N. Y. Its drainage basin lies chiefly in Herkimer and Hamilton counties and comprises a wild, rugged, and uninhabited region, largely forest-covered, but containing also extensive tracts of cut and burned-over lands. The flow of the stream is more or less regulated by lumbermen's dams, the storage of which is utilized for floating logs.

MOOSE RIVER AT MOOSE RIVER, N. Y.

A gaging station was established June 5, 1900, at Moose River village by Robert E. Horton, and has since been maintained by the U. S. Geological Survey in coöperation with this Department.

The stream is smooth above the gaging station to the foot of McKeever dam, two miles up-stream, but a short distance above the gage it is divided by an island, which creates an ice jam during winter and spring freshets. A short distance below the station a fall occurs. The bed of the stream is of cobble with occasional boulders, the current is smooth, and the depth is fairly uniform. The stream freezes over in winter, alternate layers of ice and snow or slush often forming in such a manner as to prevent discharge measurements being made.

A cableway, having a clear span of 269 feet, was erected in June, 1903, from which current-meter measurements have since been made. The initial point for soundings is the left support of the cable.

The gage, which is read twice daily by Chris Hannan, consists of a graduated board scale, attached to posts on the left bank of the stream, and comprises a high-water and a low-water section. During the ice season the gage is read once each week. The gage was carried out by an ice freshet in February, 1903, and was replaced at a slightly different elevation. The bench-mark is on the top of a boulder on the left bank, 300 feet up-stream from the cableway. Its elevation above the gage zero, prior to February 28, 1903, was 15.36 feet; after February 28, 1903, 15.53 feet.

Mean Daily Gage Height, in Feet, of Moose River at Moose River, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	2.65	1.35	2.20	4.95	6.15	2.15	2.40	0.95	0.65	1.80	2.40	1.55
2	3.50	1.50	2.55	4.40	4.85	2.55	2.60	0.80	0.65	1.30	2.45	1.55
3	3.25	1.45	2.50	3.80	4.20	2.00	2.70	0.75	1.55	1.30	2.60	1.55
4	3.35	1.30	2.25	3.70	4.60	1.90	2.40	0.75	2.15	1.60	4.35	1.65
5	4.35	1.40	2.15	3.60	5.55	1.80	1.95	0.65	3.15	2.35	4.10	1.65
6	4.15	1.40	2.10	3.40	4.40	1.90	1.75	0.95	2.50	2.30	3.10	1.65
7	3.80	1.40	2.10	3.20	4.20	2.35	2.00	1.20	1.75	2.25	3.45	1.55
8	3.30	1.30	2.10	3.00	4.15	2.75	1.35	1.00	1.50	3.45	4.85	1.45
9	3.25	1.30	2.10	3.10	3.85	2.50	0.85	0.70	1.25	5.90	4.40	1.65
10	3.05	1.30	2.10	3.00	3.60	2.25	0.85	0.75	1.15	4.25	3.70	2.75
11	3.00	1.40	2.10	3.15	3.70	2.00	0.95	0.90	1.15	3.75	3.40	6.10
12	2.85	1.50	2.10	2.75	3.35	1.80	1.05	0.80	3.20	3.50	3.10	5.15
13	2.65	1.50	2.10	2.35	3.15	1.60	1.05	0.65	2.75	3.25	3.00	4.15
14	2.40	1.50	2.20	2.45	3.00	1.55	1.15	0.55	2.25	3.25	2.90	3.35
15	2.20	1.50	2.20	1.65	2.80	1.50	1.20	0.55	1.85	3.00	2.75	3.05
16	2.20	1.50	2.10	1.35	2.60	1.45	1.05	0.65	1.40	2.75	2.60	2.65
17	2.10	1.50	2.10	1.75	2.45	1.30	0.95	0.65	1.25	2.50	2.40	2.65
18	2.10	1.50	2.10	2.45	2.40	1.15	0.85	0.75	1.40	2.20	2.25	2.45
19	2.20	1.50	2.20	1.90	2.55	0.95	0.95	0.75	1.20	2.00	2.15	2.45
20	2.30	1.50	2.30	1.65	2.75	2.80	1.05	0.75	1.00	1.80	2.05	2.35
21	2.40	1.60	2.25	1.55	2.70	2.65	1.15	0.75	0.80	1.85	2.05	2.25
22	2.55	1.70	2.30	1.45	2.55	2.15	1.25	0.70	0.75	1.75	2.05	2.35
23	2.50	1.80	2.30	1.70	2.45	1.85	1.15	0.65	1.15	1.65	2.30	2.45
24	2.35	1.95	2.45	2.15	2.35	1.45	1.05	0.60	1.15	1.65	2.25	3.20
25	2.20	2.15	2.80	4.75	2.25	1.35	0.95	0.25	1.40	1.65	2.15	4.15
26	2.10	2.10	3.05	4.40	2.00	1.25	0.85	0.25	1.70	1.45	2.15	4.50
27	2.00	2.10	3.20	5.45	2.15	1.30	1.15	0.65	1.85	1.90	1.95	3.75
28	1.95	2.10	4.80	4.75	2.45	1.60	1.10	0.75	1.90	2.30	1.65	3.65
29	1.80	......	......	4.65	2.45	1.40	1.00	0.65	2.10	3.25	1.65	3.60
30	1.70	......	......	5.15	2.00	1.60	0.95	0.65	2.45	3.25	1.65	3.65
31	1.55	......	......	......	1.80	......	0.85	0.65	......	2.85	......	3.95

Current-meter Discharge Measurements of Moose River at Moose River, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1907.		*Feet.*	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
Oct. 26...	H. K. Barrows..............	1.19	213	487	0.83	405

Rating Table for Moose River at Moose River, N. Y., from June 5, 1900, to December 31, 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
0.00	103	1.30	328	2.60	812	3.90	1,622
.10	115	1.40	354	2.70	862	4.00	1,700
.20	127	1.50	382	2.80	914	4.10	1,780
.30	140	1.60	412	2.90	968	4.20	1,870
.40	154	1.70	444	3.00	1,023	4.30	1,960
.50	170	1.80	477	3.10	1,080	4.40	2,060
.60	187	1.90	511	3.20	1,139	4.50	2,160
.70	205	2.00	547	3.30	1,200	4.60	2,260
.80	223	2.10	585	3.40	1,264	4.70	2,370
.90	242	2.20	626	3.50	1,330	4.80	2,480
1.00	262	2.30	669	3.60	1,399	4.90	2,590
1.10	282	2.40	715	3.70	1,470	5.00	2,700
1.20	304	2.50	763	3.80	1,545		

The above table is applicable only for open-channel conditions. It is well defined between gage heights 1 foot and 5 feet. Measurements above about 6 feet gage height are impracticable at this station owing to the flashy character of the stream and the quantities of running ice or logs during high stages. Hence estimates above gage height 6 feet should be used with caution.

Mean Daily Discharge, Second-feet, of Moose River at Moose River, N. Y

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.		*a*	*a*									
1	837	......	......	2,640	4,190	606	715	252	196	477	715	397
2	1,330	......	......	2,060	2,540	788	812	223	196	328	739	397
3	1,170	......	......	1,540	1,870	547	862	214	397	328	812	397
4	1,230	......	......	1,470	2,260	511	715	214	606	412	2,010	428
5	2,010	......	......	1,400	3,380	477	529	196	1,110	692	1,780	428
6	1,820	......	......	1,260	2,060	511	460	252	763	669	1,080	428
7	1,54	......	......	1,140	1,870	692	547	304	460	648	1,300	397
8	1,200	......	......	1,020	1,820	888	341	262	382	1,300	2,540	368
9	1,170	......	......	1,080	1,580	763	232	205	316	3,840	2,060	428
10	1,050	......	......	1,020	1,400	648	232	214	293	1,920	1,470	888
11	1,020	......	......	1,110	1,470	547	252	242	293	1,510	1,260	4,120
12	911	......	......	888	1,230	477	272	223	1,140	1,330	1,080	2,880
13	837	......	......	692	1,110	412	272	196	888	1,170	1,020	1,820
14	715	......	......	739	1,020	397	293	178	648	1,170	968	1,230
15	626	......	......	428	914	382	304	178	494	1,020	888	1,050
16	626	......	......	341	812	368	272	196	354	888	812	837
17	585	......	......	460	739	328	252	196	316	763	715	837
18	585	......	......	739	715	293	232	214	354	626	648	739
19	626	......	......	511	788	252	252	214	304	547	606	739
20	669	......	......	428	888	914	272	214	262	477	566	692
21	715	......	......	397	862	837	293	214	223	494	566	648
22	788	......	......	368	788	606	316	205	214	460	566	692
23	763	......	......	444	739	494	293	196	293	428	669	739
24	692	......	......	606	692	368	272	187	293	428	648	1,140
25	626	......	......	2,420	648	341	252	134	354	428	606	1,820
26	585	......	......	2,060	547	316	253	134	444	368	606	2,160
27	547	......	......	3,220	606	328	293	196	494	511	529	1,510
28	529	......	......	2,420	739	412	282	214	511	669	428	1,430
29	477	......	......	2,320	739	354	262	196	585	1,170	428	1,400
30	444	......	......	2,880	547	412	252	196	739	1,170	428	1,430
31	397	......	......	......	477	......	232	196	......	941	......	1,660
Mean	876	......	......	1,270	1,290	509	358	208	464	877	951	1,100

a Ice obstruction.

Monthly Discharge of Moose River at Moose River, N. Y.
[Drainage area, 346 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	2,010	397	876	2.53	2.91
February	....	....	....	....	....
March	....	....	....	....	....
April	3,220	341	1,270	3.67	4.11
May	4,190	477	1,290	3.73	4.29
June	914	252	509	1.47	1.65
July	862	232	358	1.03	1.18
August	304	134	208	0.601	0.691
September	1,140	196	464	1.34	1.50
October	3,840	328	877	2.53	2.91
November	2,540	428	951	2.75	3.08
December	4,120	368	1,100	3.18	3.66

SALMON RIVER DRAINAGE BASIN.

DESCRIPTION OF BASIN.

Salmon river rises in the southwestern part of Lewis county, N. Y., flows first southward then northwestward, and enters Lake Ontario near Port Ontario. The basin above the gaging station is rolling and very sandy, rock lying near the surface in the upper part of the watershed, where there are also extensive tracts of original forest. The region is subject to heavy falls of snow, which sometimes accumulates in the forest areas to a depth of several feet.

Drainage Areas Tributary to Salmon River. a

LOCALITY.	AREA IN SQUARE MILES.		
	Place to place.	Sub-total.	Total.
Salmon river above Osceola	44.04	....	44.04
Salmon river, Osceola to junction of north branch	26.03	....	70.07
North branch, Salmon river, above Mill creek	83.05	....	....
Mill creek	14.25	97.30	....
North branch, Salmon river, junction of Mill creek to mouth	2.35	99.65	169.72
Salmon river, junction of north branch to Salmon Falls	23.70	....	193.42
Salmon river, Salmon Falls to junction of Beaver Dam brook	6.05		199.47
Beaver Dam brook	15.44	....	214.47
Salmon river, Beaver Dam brook to Sandbank	1.03	....	215.94
Salmon river, Sandbank to Orwell brook	1.28	....	217.22
Orwell brook	23.13	....	240.35
Salmon river, Orwell brook to Trout brook	2.10	....	242.45
Trout brook	14.40	....	256.85
Salmon river, Trout brook to Fox bridge	1.92	....	258.77
Salmon river, Fox bridge to Pulaski	7.49	....	266.26
Salmon river, Pulaski to mouth	5.90	....	272.16

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a From U. S. G. S. topographic maps.

SALMON RIVER NEAR PULASKI, N. Y.

The gaging station was established by Robert E. Horton, September 5, 1900. It is located at Fox bridge, near Pulaski, N. Y.[a]

The stream bed is of gravel and cobble, relatively flat and shallow. The bridge consists of two spans, 183.5 feet between abutments. There are two small overflow channels and a flood plain.

Current-meter measurements are made at 5-foot intervals across the stream from the down-stream side of the bridge. The initial point for soundings is the face of the abutment at the right end of the bridge on the down-stream side.

The original gage was a vertical board scale attached to the upstream end of the center pier, having its zero mark 11.59 feet below the bench-mark, which was the top of the capstone of the central pier, up-stream end. This gage was carried away by ice in the winter of 1901-2, and was replaced July 23, 1902, by a standard weight-and-chain gage, having its datum at elevation 12.79 feet below the bench-mark. The gage readings are taken twice each day by S. J. Fox, and have been continued throughout summer and winter, the winter readings being obtained by observing the height to which the water rises in a hole in the ice. Owing to the obstruction of the river channel by ice, the discharge for the winter period has not been estimated. This gaging station was maintained January 1 to June 30, 1907, by the U. S. Geological Survey in coöperation with this Department.

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[a] The location of the gaging station is shown on the Pulaski topographic atlas sheet of the United States Geological Survey.

Mean Daily Gage Height, in Feet, of Salmon River at Fox Bridge near Pulaski, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	5.05	3.00	*a*	4.78	4.48	3.55	......	......	......	......	......	......
2	4.55	3.05	*a*	4.48	4.05	3.38	......	......	......	......	......	......
3	4.18	3.10	*a*	4.40	3.72	3.28	......	......	......	......	......	......
4	6.22	3.12	*a*	4.30	4.30	3.18	......	......	......	......	......	......
5	6.00	3.12	*a*	4.10	5.02	3.18	......	......	......	......	......	......
6	4.80	3.18	*a*	3.98	4.20	4.85	......	......	......	......	......	......
7	4.45	3.05	*a*	3.90	3.95	5.70	......	......	......	......	......	......
8	4.60	3.10	*a*	3.80	3.60	4.58	......	......	......	......	......	......
9	4.10	3.05	*a*	3.78	3.60	3.90	......	......	......	......	......	......
10	3.35	3.08	*a*	3.60	3.50	3.52	......	......	......	......	......	......
11	3.70	3.00	*a*	3.60	3.55	3.38	......	......	......	......	......	......
12	3.45	3.00	*a*	3.75	3.60	3.22	......	......	......	......	......	......
13	3.42	*a*	*a*	3.62	3.45	3.18	......	......	......	......	......	......
14	3.42	*a*	*a*	3.62	3.38	3.12	......	......	......	......	......	......
15	3.38	*a*	*a*	3.52	3.28	3.05	......	......	......	......	......	......
16	2.98	*a*	*a*	3.45	3.80	2.95	......	......	......	......	......	......
17	3.00	*a*	*a*	3.45	4.05	2.90	......	......	......	......	......	......
18	3.02	*a*	*a*	3.55	3.78	2.88	......	......	......	......	......	......
19	3.15	*a*	*a*	3.40	3.60	2.80	......	......	......	......	......	......
20	3.75	*a*	*a*	3.30	3.45	2.75	......	......	......	......	......	......
21	3.65	*a*	4.05	3.22	3.32	2.72	......	......	......	......	......	......
22	3.70	*a*	4.15	3.28	3.25	2.70	......	......	......	......	......	......
23	3.05	*a*	4.50	3.35	......	2.62	......	......	......	......	......	......
24	3.10	*a*	5.58	3.92	......	2.65	......	......	......	......	......	......
25	3.10	*a*	5.75	4.30	......	2.62	......	......	......	......	......	......
26	3.10	*a*	5.60	4.22	3.18	2.68	......	......	......	......	......	......
27	3.10	*a*	5.38	4.25	3.52	2.68	......	......	......	......	......	......
28	3.10	*a*	6.82	4.05	3.80	2.72	......	......	......	......	......	......
29	3.00	......	6.60	3.90	3.55	2.80	......	......	......	......	......	......
30	3.00	......	6.42	3.90	3.42	2.95	......	......	......	......	......	......
31	3.00	......	5.75	......	3.58	......	......	......	......	......	......	......

a River frozen over.

Rating Table for Salmon River at Fox Bridge near Pulaski, N. Y., for 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
2.20	60	3.60	781	5.00	2,640	6.40	6,530
2.30	84	3.70	865	5.10	2,840	6.50	6,930
2.40	110	3.80	965	5.20	3,020	6.60	7,340
2.50	144	3.90	1,060	5.30	3,240	6.70	7,750
2.60	181	4.00	1,180	5.40	3,460	6.80	8,190
2.70	218	4.10	1,300	5.50	3,700	6.90	8,620
2.80	265	4.20	1,420	5.60	3,950	7.00	9,070
2.90	312	4.30	1,550	5.70	4,200	7.10	9,540
3.00	364	4.40	1,680	5.80	4,490	7.20	10,000
3.10	422	4.50	1,830	5.90	4,780	7.30	10,500
3.20	480	4.60	1,980	6.00	5,100	7.40	11,000
3.30	550	4.70	2,140	6.10	5,430	7.50	11,520
3.40	620	4.80	2,300	6.20	5,770	7.60	12,060
3.50	697	4.90	2,470	6.30	6,150	7.70	12,600

Mean Daily Discharge, Second-feet, of Salmon River at Fox Bridge near Pulaski, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	2,740	364	*a*	2,260	1,790	739	.....	.....	.....	.....	.....	.....
2	1,900	393	*a*	1,790	1,240	602	.....	.....	.....	.....	.....	.....
3	1,390	422	*a*	1,680	890	532	.....	.....	.....	.....	.....	.....
4	5,860	436	*a*	1,550	1,550	466	.....	.....	.....	.....	.....	.....
5	5,100	436	*a*	1,300	2,690	466	.....	.....	.....	.....	.....	.....
6	2,300	466	*a*	1,140	1,420	2,380	.....	.....	.....	.....	.....	.....
7	1,760	393	*a*	1,060	1,120	4,200	.....	.....	.....	.....	.....	.....
8	1,960	422	*a*	965	781	1,940	.....	.....	.....	.....	.....	.....
9	1,300	393	*a*	940	781	1,060	.....	.....	.....	.....	.....	.....
10	585	408	*a*	781	697	718	.....	.....	.....	.....	.....	.....
11	865	364	*a*	781	739	602	.....	.....	.....	.....	.....	.....
12	658	364	*a*	915	781	498	.....	.....	.....	.....	.....	.....
13	639	*a*	*a*	802	658	466	.....	.....	.....	.....	.....	.....
14	639	*a*	*a*	802	602	436	.....	.....	.....	.....	.....	.....
15	602	*a*	*a*	718	532	393	.....	.....	.....	.....	.....	.....
16	350	*a*	*a*	658	965	336	.....	.....	.....	.....	.....	.....
17	364	*a*	*a*	658	1,240	307	.....	.....	.....	.....	.....	.....
18	378	*a*	*a*	739	940	294	.....	.....	.....	.....	.....	.....
19	451	*a*	*a*	620	781	253	.....	.....	.....	.....	.....	.....
20	915	*a*	*a*	550	658	228	.....	.....	.....	.....	.....	.....
21	823	*a*	1,240	498	568	216	.....	.....	.....	.....	.....	.....
22	865	*a*	1,360	532	515	204	.....	.....	.....	.....	.....	.....
23	393	*a*	1,830	585	.....	172	.....	.....	.....	.....	.....	.....
24	422	*a*	3,890	1,090	.....	182	.....	.....	.....	.....	.....	.....
25	422	*a*	4,340	1,550	.....	172	.....	.....	.....	.....	.....	.....
26	422	*a*	3,950	1,450	466	193	.....	.....	.....	.....	.....	.....
27	422	*a*	3,400	1,480	718	193	.....	.....	.....	.....	.....	.....
28	422	*a*	8,300	1,240	965	216	.....	.....	.....	.....	.....	.....
29	364	.....	7,340	1,060	739	253	.....	.....	.....	.....	.....	.....
30	361	.....	6,630	1,060	639	336	.....	.....	.....	.....	.....	.....
31	364	.....	4,340	.....	760	.....	.....	.....	.....	.....	.....	.....
Mean	1,160	405	4,240	1,040	937	635	.....	.....	.....	.....	.....	.....

a River frozen over.

Monthly Discharge of Salmon River at Fox Bridge near Pulaski, N. Y.
[Drainage area, 259 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	5,860	350	1,160	4.48	5.15
February, 12 days, 1–12	466	364	405	1.56	1.62
March, 11 days, 21–31	8,300	1,240	4,240	16.37	18.40
April	2,260	498	1,040	4.01	4.49
May, 28 days	2,690	466	937	3.62	4.16
June	4,200	172	635	2.45	2.74

GENESEE RIVER DRAINAGE BASIN.

GENESEE RIVER.

DESCRIPTION.

Genesee river rises in Potter county, Pa., eight or ten miles south of the New York–Pennsylvania boundary, flows northwestward for about thirty-two miles by general course, then turns to the northeast, and empties into Lake Ontario, seven miles north of Rochester. The entire length of the stream, following bends, is about 135 miles, and the drainage area is about 2,450 square miles.

In the northern counties the surface is rolling, with long, easy slopes, except along the streams, which usually lie in deep ravines, hemmed in by steep banks. On the whole there is a gradual rise away from the lakes, and in the upper half of the basin the country becomes rough and is broken by ridges, the summits of which attain elevations of from 2,000 to 2,500 feet above tide.

In the thirty-nine miles between Belmont, in central Allegany county, and Portage, in southwestern Livingston county, the fall of the water-surface is 253 feet, an average of 6.4 feet per mile. At Portage the river plunges down in three magnificent falls, and thence nearly to Mount Morris flows at the bottom of a deep gorge. From Mount Morris to Rochester the valley is broad and open and the stream is bordered by meadows subject to occasional overflow. At Rochester there is another abrupt descent over three heavy falls, amounting to about 260 feet within the city.

The series of remarkable lakes tributary to the Oswego basin is continued westward into the basin of the Genesee and includes Conesus, Hemlock, Canadice, and Honeoye lakes. These lakes serve as natural reservoirs and have inlets draining considerable areas at their upper ends. The slopes adjacent to the lakes themselves are narrow and steep and are drained by gulleys and torrential brooks. The area below the lakes is rolling and the soil is rich and extensively cultivated. The areas and elevations of these lakes are shown in the following table:

Areas and Elevations of Lakes in Genesee River Basin. [a]

LAKE.	Elevation.	Water-surface area.	Drainage area.	Per cent water-surface.
	Feet.	*Square miles.*	*Square miles.*	
Hemlock lake	896	2.8	46.8	6.12
Canadice lake	1,092	.7	12.6	5.57
Honeoye lake	800	2.5	39.6	6.41

[a] These lake basins are shown on the Honeoye, Canandaigua, Naples and Wayland topographic atlas sheets of the United States Geological Survey, from which the areas have been taken, with the exception of those for Hemlock and Canadice lakes, which are rom surveys of Rochester water-works.

Above all the private dams at Rochester the State formerly maintained a dam for diverting water to the Erie canal, and in the basin of Black creek, one of the upper tributaries of the Genesee from the west, are two reservoirs, owned by the State, also used for the benefit of the Erie canal.

Cuba reservoir, on the Genesee–Allegheny divide, receives the drainage from a tributary area of 26.6 square miles. The storage volume is 454,000,000 cubic feet. The overflow from this reservoir enters Allegheny river. The storage water may be turned into the summit level of the abandoned Genesee Valley canal and thence into Genesee river.

Drainage Areas of Tributaries of Genesee River. [a]

NAME OF STREAM.	AREA IN SQUARE MILES.		
	Tributary.	GENESEE RIVER.	
		Above tributary.	Below tributary.
Cryder creek	43.3	99.9	143.2
Chenunda creek	30.0	181.0	210.0
Dyke's creek	68.3	214.0	282.3
Vandemark creek	21.6	301.3	322.9
Knight's creek	22.3	323.9	346.2
Phillips creek	32.3	372.8	405.1
Vancampens creek	55.7	410.4	466.1
Angelica creek	82.1	481.1	563.2
White creek	15.9	569.2	585.1
Black creek	31.1	595.5	626.6
Crawford creek	11.8	637.6	649.4
Caneadea creek	63.3	651.0	714.3
Cold creek	41.0	745.3	786.3
Rush creek	35.3	787.0	822.3
Wiscoye:			
East Coy creek	59.9	....	....
West Coy creek	48.7	833.6	942.2
Wolf creek	19.3	974.9	994.2
Silver Lake outlet	30.4	1,029.2	1,059.6
Coshaqua creek	82.0	1,059.6	1,141.6
Canaseraga creek	258.7	1,148.4	1,407.1
Beards creek	41.3	1,423.1	1,464.4
Conesus Lake outlet	88.8	1,555.5	1,643.9
Honeoye creek	262.6	1,675.9	1,938.5
Allen's creek	198.1	1,947.1	2,145.2
Black creek	211.8	2,168.5	2,380.0
Genesee river, total at mouth	....	....	2,445.6

[a] From an early report on Genesee river storage.

GENESEE RIVER AT ELMWOOD AVENUE, ROCHESTER, N. Y.

This station was established by Robert E. Horton, February 9, 1904, and was maintained by the U. S. Geological Survey in coöperation with this Department until May, 1907, when it was turned over to the Barge canal department. It is located at the Elmwood avenue bridge, in Rochester, N. Y.

The stream bed is of gravel and is clean and fairly permanent. The bridge consists of six spans of about 125 feet each. Conditions are favorable for the use of a current-meter. This gage is located above the State diverting dam, which causes, however, but little fluctuation in the level.

Discharge measurements are made from the down-stream side of Elmwood avenue bridge. The initial point for soundings is the top of the face of the left abutment, down-stream side. A standard cypress staff gage, which is read under the direction of E. A. Fisher, city engineer, is secured to the down-stream face of the first pier from the right-hand abutment of the bridge. The gage is sixteen feet long and is graduated decimally with galvanized-iron division marks.

Comparative Elevations.

	Rochester city datum.	Barge canal datum.
Zero, Elmwood avenue gage	**245.591**	**506.848**
Crest, Johnston and Seymour dam	**241.91**	**503.16**

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Genesee River at Elmwood Ave. Bridge, Rochester, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	511.30	509.70	508.50	510.20	510.30	508.70	509.20	507.90	507.60	507.80	508.00	508.60
2	511.00	509.40	508.70	509.80	510.20	508.60	510.30	507.90	507.60	508.10	507.90	508.60
3	510.60	511.40	509.60	509.50	509.90	508.70	509.40	508.00	507.60	508.00	507.90	508.50
4	512.00	511.50	509.50	509.30	509.70	509.80	509.10	507.90	507.60	508.00	507.90	508.40
5	513.42	511.20	509.20	509.20	510.90	509.20	508.60	507.80	507.60	508.00	508.40	508.40
6	512.10	511.00	508.80	509.20	510.70	509.00	508.50	507.80	507.60	509.00	508.40	508.30
7	511.10	510.80	508.90	509.10	509.90	510.20	508.40	507.80	507.60	508.60	508.60	508.30
8	512.25	510.60	508.70	509.00	509.70	509.60	508.20	507.70	507.60	508.40	509.20	508.30
9	513.85	510.40	508.50	509.00	510.20	509.00	508.10	507.70	507.60	509.00	510.70	508.20
10	513.20	510.20	508.40	509.00	509.80	508.70	508.00	507.70	507.60	509.60	510.00	508.20
11	511.50	510.00	508.30	509.10	509.60	508.60	507.90	507.70	507.70	508.90	509.70	509.30
12	510.60	509.80	508.20	509.40	509.40	508.50	507.80	507.70	507.80	508.60	509.30	510.50
13	510.20	509.80	508.50	509.80	509.30	508.40	510.25	507.70	507.80	508.60	509.00	509.60
14	510.00	509.60	509.70	510.00	509.10	508.30	509.70	507.70	507.85	508.50	508.70	509.20
15	510.40	509.40	511.40	509.80	508.80	508.20	508.90	507.70	507.80	508.50	508.70	509.10
16	510.50	509.40	513.20	509.70	508.90	508.20	508.50	507.65	507.70	508.40	508.50	509.00
17	509.50	509.30	512.40	509.60	509.10	508.20	508.30	507.65	507.70	508.20	508.30	509.20
18	509.40	509.10	512.70	509.50	509.10	508.20	508.20	507.60	507.70	508.10	508.30	509.70
19	509.40	509.10	512.70	509.40	509.00	508.20	508.10	507.60	507.70	508.00	508.30	509.40
20	511.10	509.00	511.80	509.20	508.80	508.20	508.00	507.60	507.65	507.90	508.30	509.00
21	511.50	509.10	511.90	509.10	508.90	508.70	508.00	507.60	507.65	507.90	508.30	508.90
22	511.00	509.10	511.50	509.00	508.70	508.50	508.20	507.60	507.65	507.90	508.30	509.00
23	509.90	509.20	511.40	508.80	508.60	508.70	508.10	507.60	507.65	508.00	508.10	509.70
24	509.50	509.10	512.50	509.40	508.60	509.20	508.70	507.60	507.70	507.90	508.30	512.80
25	509.30	509.00	511.80	513.25	508.50	509.40	508.30	507.65	507.70	507.90	508.30	514.60
26	509.80	508.60	511.00	511.80	508.50	509.40	508.10	507.60	507.70	507.90	508.30	514.00
27	510.50	508.50	510.60	512.80	508.50	509.40	508.30	507.60	507.60	507.90	508.30	512.00
28	510.20	508.50	512.00	512.60	509.30	508.90	508.20	507.60	507.60	507.80	508.40	512.30
29	510.10	......	512.80	511.20	509.50	508.70	508.00	507.60	507.60	507.90	508.50	514.05
30	509.80	......	511.90	510.50	509.20	508.60	507.90	507.60	507.70	508.00	508.70	513.70
31	509.80	......	510.70	......	508.90	......	507.90	507.60	......	508.20	......	512.40

Current-meter Discharge Measurements of Genesee River, at Rochester, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907. March 18[a]	C. C. Covert................	6.02	383	2,820	3.95	11,130

[a] Occasional cakes of floating ice; ice practically all out of river.

Rating Table for Genesee River at Rochester, N. Y., for 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1.00	400	3.70	5,080	6.40	12,600	9.10	21,760
1.10	490	3.80	5,320	6.50	12,900	9.20	22,120
1.20	580	3.90	5,560	6.60	13,220	9.30	22,480
1.30	670	4.00	5,800	6.70	13,540	9.40	22,840
1.40	760	4.10	6,060	6.80	13,860	9.50	23,200
1.50	850	4.20	6,320	6.90	14,180	9.60	23,580
1.60	1,000	4.30	6,580	7.00	14,500	9.70	23,960
1.70	1,150	4.40	6,840	7.10	14,820	9.80	24,340
1.80	1,300	4.50	7,100	7.20	15,140	9.90	24,720
1.90	1,450	4.60	7,380	7.30	15,460	10.00	25,100
2.00	1,600	4.70	7,660	7.40	15,780	10.10	25,480
2.10	1,780	4.80	7,940	7.50	16,100	10.20	25,860
2.20	1,960	4.90	8,220	7.60	16,440	10.30	26,240
2.30	2,140	5.00	8,500	7.70	16,780	10.40	26,620
2.40	2,320	5.10	8,780	7.80	17,120	10.50	27,000
2.50	2,500	5.20	9,060	7.90	17,460	10.60	27,400
2.60	2,700	5.30	9,340	8.00	17,800	10.70	27,800
2.70	2,900	5.40	9,620	8.10	18,160	10.80	28,200
2.80	3,100	5.50	9,900	8.20	18,520	10.90	28,600
2.90	3,300	5.60	10,200	8.30	18,880	11.00	29,000
3.00	3,500	5.70	10,500	8.40	19,240	11.10	29,400
3.10	3,610	5.80	10,800	8.50	19,600	11.20	29,800
3.20	3,940	5.90	11,100	8.60	19,960	11.30	30,200
3.30	4,160	6.00	11,400	8.70	20,320	11.40	30,600
3.40	4,380	6.10	11,700	8.80	20,680	11.50	31,000
3.50	4,600	6.20	12,000	8.90	21,040		
3.60	4,840	6.30	12,300	9.00	21,400		

Mean Daily Discharge, Second-feet, of Genesee River at Elmwood Ave. Bridge, Rochester, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	7,380	......	......	4,600	4,840	1,600	2,500	580	310	490	670	1,450
2	8,500	......	......	3,720	4,600	1,450	4,840	580	310	760	580	1,450
3	5,560	......	......	3,100	3,940	1,600	2,900	670	310	670	580	1,300
4	9,340	......	......	2,700	3,500	3,720	2,320	580	310	670	580	1,150
5	13,620	......	......	2,500	6,320	2,500	1,450	490	310	670	1,150	1,150
6	9,620	......	......	2,500	5,800	2,140	1,300	490	310	2,140	1,150	1,000
7	6,840	......	......	2,320	3,940	4,600	1,150	490	310	1,450	1,450	1,000
8	10,050	......	......	2,140	3,500	3,300	850	400	310	1,150	2,500	1,000
9	14,980	......	......	2,140	4,600	2,140	760	400	310	2,140	5,800	850
10	12,900	......	......	2,140	3,720	1,600	670	400	310	3,300	4,160	850
11	7,940	......	......	2,320	3,300	1,450	580	400	400	1,960	3,500	2,700
12	5,560	......	......	2,900	2,900	1,300	490	400	490	1,450	2,700	5,320
13	4,600	......	......	3,720	2,700	1,150	4,720	400	490	1,450	2,140	3,300
14	4,160	......	......	4,160	2,320	1,000	3,500	400	535	1,300	1,600	2,500
15	5,080	......	......	3,720	1,780	850	1,960	400	490	1,300	1,600	2,320
16	5,320	......	12,900	3,500	1,960	850	1,300	355	400	1,150	1,300	2,140
17	3,100	......	10,500	3,300	2,320	850	1,000	355	400	850	1,000	2,500
18	2,900	......	11,400	3,100	2,320	850	850	310	400	760	1,000	3,500
19	2,900	......	11,400	2,900	2,140	850	760	310	400	670	1,000	2,900
20	6,840	......	8,780	2,500	1,780	850	670	310	355	580	1,000	2,140
21	7,940	......	9,060	2,320	1,960	1,600	670	310	355	580	1,000	1,960
22	6,580	......	7,940	2,140	1,600	1,300	850	310	355	580	1,000	2,140
23	3,940	......	7,660	1,780	1,450	1,600	1,000	310	355	670	760	3,500
24	3,100	......	10,800	2,900	1,450	2,500	1,600	310	400	580	1,000	11,700
25	2,700	......	8,780	13,060	1,300	2,900	1,000	355	400	580	1,000	17,460
26	3,720	......	6,580	8,780	1,300	2,900	760	310	400	580	1,000	15,460
27	5,320	......	5,560	11,700	1,300	2,900	1,000	310	310	580	1,000	9,340
28	4,600	......	9,340	11,100	2,700	1,960	850	310	310	490	1,150	10,200
29	4,380	......	11,700	7,100	3,100	1,600	670	310	310	580	1,300	15,620
30	3,720	......	9,060	5,320	2,500	1,450	580	310	400	670	1,600	14,500
31	3,720	......	5,800	......	1,960	......	580	310	......	850	......	10,500
Mean	6,352	......	9,204	4,206	2,868	1,845	1,424	393	368	1,014	1,542	4,932

Monthly Discharge of Genesee River at Elmwood Ave. Bridge, Rochester, N. Y.

[Drainage area, 2,365 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	13,620	2,700	6,352	2.69	3.09
February	....	....	....	....	....
March	....	....	....	....	....
April	13,060	1,780	4,206	1.78	1.99
May	6,320	1,300	2,868	1.21	1.39
June	4,600	850	1,845	0.780	0.874
July	4,840	490	1,424	0.602	0.692
August	670	310	393	0.166	0.191
September	535	310	368	0.156	0.175
October	3,300	490	1,014	0.429	0.493
November	5,800	580	1,542	0.652	0.730
December	17,460	850	4,932	2.09	2.40

GENESEE RIVER AT GENESEE JUNCTION, N. Y.

This gaging station, which is located at the West Shore Railroad bridge, was established by Geo. T. Keith, March 21, 1905. The gage is placed in a horizontal position and secured to the lower chord of the south truss at center of bridge.

Readings are taken each morning by means of a chain-and-plumb-bob gage, by G. E. Krill.

The West Shore Railroad bridge is about five and one-quarter miles south of the Elmwood avenue bridge in Rochester. The only tributaries to the Genesee river between these points are the little Black creek on the west, with a drainage area of nineteen square miles, and Red creek on the east, with a drainage area of twenty-four square miles. The total difference of drainage area between this gaging station and the Elmwood avenue gaging station is about forty-three square miles.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Genesee River at Genesee Junction, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	512.7	512.2	510.5	511.7	511.9	509.1	508.7	508.1	......	a	a	509.2
2	514.1	512.3	510.5	511.7	511.9	......	511.6	508.1	507.7	a	a	509.0
3	514.7	......	......	511.2	511.9	509.1	511.6	508.1	507.7	a	a	508.9
4	514.7	512.2	510.5	510.7	512.9	510.9	509.1	......	507.7	a	a	508.6
5	516.7	511.3	510.5	510.2	......	509.9	508.9	507.9	507.7	a	a	508.5
6	......	510.3	509.5	510.2	512.9	510.3	508.9	507.9	507.7	a	a	508.5
7	514.7	510.3	509.3	......	512.9	511.6	......	507.9	507.8	a	a	508.8
8	514.7	510.2	509.1	509.9	......	511.6	508.6	507.9	......	a	a	508.6
9	517.7	510.2	509.1	509.9	......	......	508.6	507.9	507.8	a	a	508.5
10	517.4	......	......	509.9	510.9	508.9	508.6	507.8	507.8	a	a	508.7
11	515.2	510.2	510.2	509.9	510.9	508.9	508.6	......	507.9	a	a	509.1
12	512.2	510.2	510.2	510.4	......	508.9	509.4	507.8	507.9	a	a	512.3
13	......	509.9	512.2	511.2	510.3	508.6	511.8	507.8	507.9	a	a	510.8
14	512.2	509.9	512.2	......	509.9	508.6	......	507.7	507.9	a	509.3	509.9
15	512.2	509.9	514.2	511.2	509.9	508.6	509.8	507.7	......	a	509.1	509.6
16	511.6	509.9	515.1	511.2	509.4	......	509.8	507.7	507.9	a	509.0	509.4
17	511.3	......	......	511.2	509.4	508.4	509.5	507.7	507.8	a	508.1	509.1
18	510.2	509.7	515.2	510.4	509.6	508.4	508.5	......	507.8	a	508.6	510.3
19	510.2	509.7	515.2	510.4	......	508.4	508.5	507.9	507.7	a	508.6	509.9
20	......	509.7	514.5	510.4	509.4	508.4	508.4	507.9	507.7	a	508.5	509.8
21	515.2	509.7	514.5	......	509.2	509.1	......	507.7	507.7	a	508.5	509.3
22	515.2	509.7	515.5	510.4	509.1	509.1	508.4	507.7	......	a	508.4	509.4
23	513.4	509.7	515.5	510.4	509.1	......	509.1	507.7	507.7	a	508.3	509.4
24	510.8	......	......	512.4	508.9	509.1	509.1	507.7	507.8	a	508.6	510.9
25	510.8	509.7	513.9	515.6	508.9	510.1	508.7	......	507.9	a	508.5	518.5
26	510.8	509.7	513.3	514.7	......	510.1	508.4	507.7	507.9	a	508.4	517.8
27	......	510.5	512.4	515.5	509.7	509.9	508.4	507.7	507.9	a	508.5	515.2
28	515.2	510.5	514.5	......	509.7	509.9	......	507.7	507.9	a	508.6	515.4
29	513.4	......	516.9	511.8	509.4	508.7	508.2	507.7	......	a	508.9	517.7
30	513.4	......	514.6	511.8	509.4	......	508.2	507.7	507.9	a	509.3	517.4
31	512.2	......	......	......	509.1	......	518.1	507.7	......	a	......	515.5

a No record October 1 to November 13.

GENESEE RIVER AT MT. MORRIS, N. Y.

A gaging station has been established at the dam of the Mt. Morris Water Power Company, in the village of Mt. Morris, N. Y., and readings have been taken regularly twice each day, by John McAstocker, since September 1, 1905.

The station was established by Robert E. Horton, and is maintained by the U. S. Geological Survey in coöperation with this Department.

The dam is of masonry construction, having a horizontal crest of ogee cross-sections, 255.7 feet long. There are two wasteways, having crests each 12 inches wide and 18.0 feet and 17.9 feet long, respectively, closed by stop-planks to about two feet above the main crest; also one short spillway with crest 6 inches wide and 17 feet long, and about one foot higher than the wasteways. The dam and the spillways are separated by masonry piers.

A portion of the flow is diverted through a section of the old Genesee Valley canal, which is utilized as a head-race, the power being used to drive a number of mills and factories. In order to determine the amount of this diversion, a gage has been placed in the tail-race below the mills, and it is read twice each day by F. M. Goff, electrical engineer in the employ of the Power Company. A number of meter measurements have been made and a rating curve to determine the daily flow through the canal is partly developed.

Current-meter Discharge Measurements on Tail-race, Mt. Morris Power Co., Mt. Morris, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1906.						
April 23	C. C. Covert	2.15	34	82.3	1.58	130
Sept. 15	C. C. Covert	2.15	36	90.1	1.36	123
1907.						
Mar. 18a	C. C. Covert	2.40	34	97.6	2.49	243

a Measured on down-stream side of bridge; the channel below was considerably obstructed by brush, causing more or less backwater.

CANADICE LAKE.

DESCRIPTION.

Canadice lake is tributary to Genesee river through Hemlock lake outlet and Honeoye creek. The area drained by the lake forms an irregular rectangle, the lake lying somewhat to the left of the longitudinal axis and the greater portion of the drainage being on the eastern slope. The western slope is narrow and precipitous. Bald Hill rises from an altitude of 1,090 feet at the lake to 1,800 feet at the summit and has its axis parallel to the lake at an average distance of three-fourths of a mile from it. The lake has a water-surface area of 0.7 square mile and drains a total area of 12.6 square miles, 5.6 per cent of which is lake surface.

CANADICE LAKE OUTLET NEAR HEMLOCK, N. Y.

A weir was constructed at the outlet at the foot of the lake by the city engineer's department of Rochester, N. Y., in February, 1903. The entire yield of the drainage basin passes this weir.

A standard thin-edged weir, with a five-foot crest and two end contractions, is so arranged with needle-timbers at the ends that during high water the length may be increased to 14.96 feet with no end contractions. The weir crest stands three feet above the stream channel and is never submerged by backwater. There are two additional rectangular gates each one foot square, with three complete contractions and a fourth partial contraction at the bottom. The outflow from the lake above the weir is controlled by gates.

A reading of the depth of the weir is taken each morning, and also for each change of the gates, the depth being read to hundredths and corrections being made for velocity of approach for the larger discharges. The discharge is calculated by the Francis formula. The record has been furnished by E. A. Fisher, city engineer, and John F. Skinner, principal assistant city engineer, of Rochester, N. Y.

Monthly Discharge of Canadice Lake Outlet at Hemlock, N. Y
[Drainage area, 12.6 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	....	....	27.56	2.19	2.52
February	....	....	13.06	1.04	1.08
March	....	....	17.26	1.37	1.58
April	....	....	21.37	1.70	1.90
May	....	....	11.18	0.888	1.02
June	....	....	7.66	0.608	0.681
July	....	....	7.63	0.606	0.697
August	....	....	5.90	0.468	0.538
September	....	....	4.40	0.349	0.391
October	....	....	3.44	0.273	0.314
November	....	....	6.20	0.492	0.551
December	....	....	17.02	1.35	1.55

OSWEGO-ONEIDA-SENECA RIVER DRAINAGE BASIN.

DESCRIPTION OF BASIN.

Oswego river is formed by the union of Seneca and Oneida rivers at Three River Point about twelve miles northwest of Syracuse, N. Y., whence its course is northwestward to Oswego, where it enters Lake Ontario. The length of the river, from the junction to the mouth, is about 20.5 miles, and the drainage basin along this distance is a narrow strip of country, moderately rolling. Above the junction of Seneca and Oneida rivers the basin spreads out, attaining an extreme width east and west of about 100 miles and north and south of from seventy to eighty miles. There is, on the whole, a gradual rise from the low, level lands which border Lake Ontario to the north-south ridges which separate the various lakes south of Seneca river and which farther south become merged with the still more elevated country lying along the southern boundary of the Lake Ontario watershed.

The most remarkable feature of the drainage basin is the chain of lakes stretching across its southern border. From west to east the principal lakes are, in order, Canandaigua, Keuka, Seneca, Cayuga, Owasco, Skaneateles and Oneida. These seven lakes include a water-surface of, approximately, 280 square miles, increased by four smaller lakes — Cross, Onondaga, Otisco and Cazenovia — to about 295 square miles. The larger of the lakes, Oneida, Cayuga and Seneca, are used for steam-towing navigation, having connection with the Erie and Oswego canals. Cayuga and Seneca lakes are noted for their depth and for the abrupt slopes of their beds. The influence of the lakes on Oswego river is of the utmost importance in contributing to the steadiness of its flow.

A fall of 100 feet in the course of the main river is largely utilized by seven dams, which also partly canalize the stream. The intervening stretches are covered by the Oswego canal, which draws its water-supply from the river.

Drainage Areas Tributary to Oneida Lake and Oneida River.[a]

NAME OF STREAM.	AREA IN SQUARE MILES.		
	Place to place.	Sub-total.	Total.
East branch, Fish creek.			
Head to junction with Alder creek	45.4		
Alder creek	25.7	71.1	
Junction with Alder creek to junction with Point Rock creek	36.7	107.8	
Point Rock creek	19.9	127.7	
Junction with Point Rock creek to junction with Fall brook	4.5	132.2	
Fall brook	13.5	145.7	
Junction with Fall brook to junction with Florence creek	1.3	147.0	
Florence creek	20.4	167.4	
Junction with Florence creek to junction with Furnace creek (Taberg)	1.7	169.1	
Furnace creek	14.4	183.5	
Taberg to junction with West branch, Fish creek	3.6	187.1	
West branch, Fish creek.			
Head to lower dam, Williamston	25.8	25.8	
Williamston to West Camden	27.1	52.9	
West Camden to junction with Mad river, Camden	14.2	67.1	
Mad river	45.4	112.5	
Camden to junction with Little river	21.6	134.1	
Little river	52.1	186.2	
Little river to McConnellsville	4.0	190.2	
McConnellsville to junction with East branch, Fish creek	11.9	202.1	
Junction of East and West branches, Fish creek, to junction with Wood creek	27.8	389.2	417.0
Wood creek.			
Above Erie canal, Rome	10.2	10.2	
Erie canal, Rome, to junction with Mud creek	2.0	12.2	
Mud creek	20.0	32.2	
Junction with Mud creek to junction with Canada creek	6.4	38.6	
Canada creek	31.0	69.6	
Junction with Canada creek to junction with Stoney creek	1.2	70.8	
Stoney creek	20.4	91.2	
Junction with Stoney creek to junction with Fish creek	31.4	122.6	122.6
Oneida creek.			
Head to Peterboro	13.4	13.4	
Peterboro to falls	6.7	20.1	
Falls to Munnsville	15.6	35.7	
Munnsville to Kenwood	27.3	63.0	
Kenwood to Oneida Castle (State dam)	10.8	73.8	
Oneida Castle to Sconondoa creek, Oneida	2.1	75.9	
Sconondoa creek	34.3	110.2	
Sconondoa creek to Durhamville	4.8	115.0	
Durhamville to mouth	28.0	143.0	143.0
Canaseraga creek.			
Head to Perryville	5.7		
Perryville to Erie canal	9.0	14.7	
Erie canal to Douglas ditch	8.1	22.8	
Cowassalon creek.			
Head to Clockville creek	17.2	17.2	
Clockville creek	11.1	28.3	
Clockville creek to Erie canal	5.5	33.8	
Erie canal to mouth of Douglas ditch	39.3	73.1	
Junction with Douglas ditch to Lakeport	3.2	95.9	99.1
Chittenango creek.			
Erieville reservoir, water-surface	.45		
Erieville reservoir, land drainage	3.30	3.75	
Erieville reservoir to Cazenovia lake	30.5	34.25	
Cazenovia lake, water-surface	1.7	35.95	
Cazenovia lake, land drainage	8.7	44.65	
Cazenovia lake to Chittenango falls	14.4	59.05	
Chittenango falls to State dam, Chittenango	17.9	76.95	
State dam to junction with Butternut creek	28.1	105.05	
Butternut creek.			
Head to Jamesville reservoir	47.4	47.4	
Jamesville reservoir to State dam	5.7	53.1	
State dam to junction with Limestone creek	19.2	72.3	

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[a] From U. S. Geological Survey topographic maps.

Drainage Areas Tributary to Oneida Lake and Oneida River—(Concluded).

NAME OF STREAM.	AREA IN SQUARE MILES.		
	Place to place.	Sub-total.	Total.
Limestone creek.			
De Ruyter reservoir, water-surface	1.0		
De Ruyter reservoir, land drainage	17.8	18.8	
De Ruyter reservoir to junction with East branch	4.3	23.1	
East, or New Woodstock branch	12.6	35.7	
Junction with East branch to junction with West branch	34.5	70.2	
West branch, Limestone creek, enters above State feeder dam	24.8	95.0	
State dam to junction with Butternut creek	18.2	113.2	185.5
Junction with Limestock creek to Chittenango creek.	1.1	186.6	291.65
Chittenango creek, junction with Butternut creek to Bridgeport	30.3	321.95	
Chittenango creek, Bridgeport to Oneida lake	4.3	326.25	326.25
Oneida lake drainage through main streams	....	1,107.95	
Big Bay creek	26.3		
Little Bay creek	11.5		
Scriba creek	45.4		
Coast drainage, north shore Oneida lake	54.5		
Coast drainage, south shore Oneida lake	28.9	166.6	1,274.55
Water-surface, Oneida lake	78		
Land drainage, Oneida lake	1,274.55	1,352.55	
Oneida river.			
Brewerton to Caughdenoy creek	4.8	4.8	1,357.9
Caughdenoy creek	19.3	24.1	1,376.7
Caughdenoy creek to Oak Orchard	25.1	49.2	1,401.8
Mud creek	34.7	83.9	1,436.5
Oak Orchard to Potts creek	5.0	88.9	1,441.5
Potts creek	22.9	111.8	1,464.4
Six Mile creek	24.0	135.8	1,488.4
Potts creek to Three River Point	4.5	140.3	1,492.9

Drainage Areas Tributary to Seneca River. [a]

NAME OF STREAM.	AREA IN SQUARE MILES.			
	Place to place.	Sub-total.	Branch total.	General total.
Mud creek.				
Head to and including Schaffer creek	51.31			
Junction with Schaffer creek to junction with Sucker brook, Victor (formerly Ganargua creek)	25.70	77.01		
Sucker brook	20.15	97.16		
Ganargua creek.				
Victor to Erie canal, Macedon	26.20	123.36		
Macedon to junction with East Red creek, East Palmyra	55.0	178.36		
East Red creek	59.5	237.86		
East Red creek to Canandaigua outlet	61.37	299.23	299.23	
Canandaigua lake.				
Naples creek	48.55	171.97		
West river	42.08			
Other land drainage	81.34			
Water-surface	16.40	....	188.37	
Canandaigua outlet.				
Foot of lake to and including Black brook	50.37	238.74		
Black brook to Flint creek, at Phelps	54.34	293.08	293.08	

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[a] From U. S. Geological Survey topographic maps.

Drainage Areas Tributary to Seneca River—(Continued).

NAME OF STREAM.	AREA IN SQUARE MILES.			
	Place to place.	Sub-total.	Branch total.	General total.
Flint creek.				
Above Patten	31.59			
Patten to Gorham, not including Gorham swamp	24.84	56.43		
Gorham swamp	5 46	61 89		
Gorham to Orleans	25 57	87.46		
Orleans to junction with Canandaigua outlet at Phelps	15.21	102.67	395.75	
Phelps to junction with Ganargua creek at Lyons, forming Clyde river	48.36	444.11	743.34	
Clyde river.				
Lyons to junction with Seneca river, foot of Cayuga lake	141.11	884.45	....	884.45
Seneca river.				
Seneca lake.				
Keuka lake.				
Land drainage to outlet	160.96			
Water-surface	17.51	178.47		
Keuka outlet to Seneca lake	24.80	203.27	640.93	
Catharine creek.				
Above Montour Falls	66.46	....		
Montour Falls to Seneca lake	29.91	96.37		
Watkins Glen creek	23.53	23.53		
Direct lake drainage	317.76	317.76		
Water-surface	67.16	....	708.09	
Seneca river, foot of Seneca lake to Waterloo	40.90	....	748.99	
Seneca river, Waterloo to Seneca Falls	28.55	....	777.54	
Seneca river, Seneca falls to Mud lock, foot of Cayuga lake	7.52	....	785.06	
Cayuga lake.				
Cascadilla creek	14.38			
Six Mile creek	59.05			
Buttermilk creek	29.16			
Cayuga inlet	67.02			
Salmon creek	91.13			
Fall creek.				
Above Freeville	58.68			
Virgil creek	26.00	84.68		
Freeville to Cornell dam	30.62	115.20		
Cornell dam to Cayuga lake	1.56	116.76		
Taghanic creek.				
Above Halseyville	56.96			
Halseyville to Taghanic falls	10.40	67.36		
Taghanic falls to Cayuga lake	.39	67.75		
Other Cayuga lake drainage	275.04	720.29		
Cayuga lake, water-surface	66.31	786.60	1,571.60	
Seneca river, Cayuga lake, to junction with Clyde river	15.42	....	1,587.02	2,471.47
Seneca river, junction with Clyde river to junction with Owasco outlet	146.23	....	....	2,617.70
Owasco lake.				
Owasco inlet, above Moravia	74.33			
Moravia to Owasco lake	42.92	117.25		
Direct drainage to lake	76.24	193.49		
Foot of lake to State dam	.98	194.47		
Water-surface	10.40	204.87		
Owasco outlet to junction with Seneca river	16.73	221.66	....	2,839.30
Seneca river, junction with Owasco outlet, to junction with Skaneateles outlet	98.70	....	....	2,938.00
Skaneateles lake.				
Land drainage to foot	58.41			
Water-surface	14.13	72.54		
Foot of lake to Willow Glen	1 84	74.38		
Willow Glen to Seneca river	16.69	91.07	....	3,029.07
Seneca river, Skaneateles outlet to Carpenter brook	25.50	....	....	3,054.57
Carpenter brook	18.70	....	....	3,073.27
Carpenter brook to Baldwinsville	48.10	....	....	3,121.87
Baldwinsville to Onondaga outlet	17.80	....	....	3,139.17

Drainage Areas Tributary to Seneca River—(Concluded).

NAME OF STREAM.	AREA IN SQUARE MILES.			
	Place to place.	Sub-total.	Branch total.	General total.
Onondaga lake.				
Otisco lake, land drainage to foot	41.40			
Otisco lake, water-surface	3.30	44.70		
Nine Mile creek (Otisco outlet) to Onondaga lake	74.0	118.70		
Onondaga creek.				
Above junction with West brook	40.6			
Junction with West Brook to inflow to Onondaga lake	65.3	105.9		
Other land drainage to Onondaga lake	59.1	283.7		
Onondaga lake, water-surface	4.7	288.4		
Onondaga lake, outlet to Seneca river.	3.0	291.4	....	3,430.57
Seneca river, Onondaga outlet to Belgium	10.12	....	....	3,440.69
Seneca river, Belgium to Three River P't.	4.4	....	....	3,445.09

Drainage Areas Tributary to Oswego River.[a]

NAME OF STREAM.	AREA IN SQUARE MILES.		
	Place to place.	Total from Three River Point.	Total drainage basin.
Oneida river, above Three River Point	....	....	1,493
Seneca river, above Three River Point	....	....	3,445
Oswego river at Three River Point	....	....	4,938
Three River Point to Phoenix	2.32	2.32	4,940.32
Phoenix to Hinmansville	17.58	19.90	4,957.90
Hinmansville to Ox creek	17.05	87.15	4,975.15
Ox creek	33.68	70.83	5,008.83
Ox creek to upper dam, Fulton	9.15	79.98	5,016.98
Fulton to Neatawanta creek	9.15	89.13	5,027.13
Neatawanta creek	21.92	111.05	5,049.05
Neatawanta creek to Black creek	1.01	112.06	5,050.06
Black creek	37.93	149.99	5,087.99
Black creek to Battle Island	.92	150.91	5,088.91
Battle Island to Minetto	2.11	153.02	5,091.02
Minetto to High dam	4.87	157.89	5,095.89
High dam to Oswego dam	1.22	159.11	5,097.11
Oswego dam to Lake Ontario	1.21	160.32	5,098.32

[a] From U. S. Geological Survey topographic maps.

GAGES ON OSWEGO RIVER.

The drainage directly tributary to Oswego river is 160 square miles. This area comprises chiefly moderately-rolling, cultivated upland, having a good depth of soil overlying the rock, which, as a rule, is visible only in the bed of the stream. A portion of the area is drained through lakes and marshes. The run-off from the direct drainage to Oswego river is moderate and the regimen differs but little from that resulting from the inflow of the two main tributaries — the Oneida and Seneca.

Gages for Determining Elevation of Water-surface on Oswego River.

LOCATION.	DISTANCE IN MILES.[*]		Usual time of reading gage.	Present type of gage.
	From curved dam, Oswego.	Station to station.		
Above Oswego curved dam	0	0	8 a. m.	Board with coppered staples.
Below High dam	1.1	1.1	8 a. m.	Painted board scale.
Above High dam	.1	1.2	8 a. m.	Reference point.
Below Minetto dam	2.3	3.5	6:30 a. m.	Chain and plumb-bob.
Above Minetto dam	.1	3.6	6:30 a. m.	Chain and plumb-bob.
Below Braddock dam[†]	3.2	6.8	9 a. m.	Chain and plumb-bob.
Above Braddock dam	.0	6.8	9 a. m.	Board with coppered staples.
Mouth of Waterhouse creek	2.3	9.1	9 a. m.	Reference point.
Manhattan Villa	.7	9.8	9 a. m.	Chain and plumb-bob.
Above lower Fulton dam	.3	10.1	9 a. m.	Painted board.
Above Oswego Falls dam	.8	10.9	10 a. m.	Reference point.
Mouth of Ox creek	3.9	14.8	11 a. m.	Board with coppered staples.
Below Horseshoe dam	1.0	15.8	1 p. m.	Chain and plumb-bob
Above Horseshoe dam	.2	16.0	1 p. m.	Chain and plumb-bob.
Hinmansville	.9	16.9	1 p. m.	Chain and plumb-bob.
Below Phoenix dam	3.0	19.8	Noon	Board with coppered staples.
Above Phoenix dam	.1	20.0	Noon	Board with coppered staples.

[*] Measured along course of stream on U. S. Geological Survey topographic map.
[†] Called also Battle Island dam.

OSWEGO RIVER ABOVE CURVED DAM, OSWEGO, N. Y.

A gage was erected above the State dam on Oswego river at Oswego, April 7, 1904, by this Department. The gage at present used is a ⅞-inch by 6-inch vertical board, graduated with coppered staples and brass figures, reading from zero to 9 feet. The elevation of the zero mark of the gage is 264.26. The elevation of the crest of the curved dam is 264.9. Water is diverted to the Oswego canal and to the hydraulic power canals of the Oswego Canal Company at the right-hand end of the dam and to the Varick power canal at the left-hand side. The gage is attached to the down-stream side of the crib pier at the entrance to the Varick canal above the dam. It is read each morning by D. D. Tompkins.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Curved Dam, Oswego, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	269.4	268.7	267.6	269.4	268.9	268.0	268.0	267.6	......	267.6	268.2	......
2	269.2	268.6	267.9	269.3	268.9	......	268.1	267.6	267.3	267.5	268.1	268.8
3	269.3	......	......	269.2	268.8	267.9	268.1	267.5	267.4	267.5	......	268.7
4	269.9	268.8	267.9	269.1	268.9	267.8	268.1	......	267.6	267.7	268.4	268.7
5	270.0	268.6	267.9	269.0	......	267.7	268.2	267.3	267.1	267.5	268.4	268.6
6	......	268.4	267.8	268.9	268.9	267.8	268.1	267.3	267.5	......	268.5	268.5
7	270.2	268.8	267.9	......	268.8	267.8	......	267.3	267.4	267.6	268.7	268.4
8	270.4	268.7	267.9	268.9	268.7	267.8	268.1	267.3	......	267.8	269.4	......
9	270.3	268.7	268.0	268.8	268.7	......	268.1	267.2	267.1	267.8	269.5	268.3
10	270.2	......	......	268.7	268.7	267.8	267.9	267.2	267.5	267.8	......	268.5
11	270.2	268.8	267.8	268.7	268.6	267.8	267.9	......	267.5	267.9	269.6	268.6
12	270.3	267.9	267.7	268.7	......	267.7	267.9	267.4	267.5	268.0	269.4	268.6
13	......	268.3	267.8	268.6	268.8	267.7	267.8	267.4	267.5	......	269.4	268.7
14	270.0	268.3	267.9	......	268.6	267.6	......	267.2	267.6	268.1	269.3	268.7
15	269.9	268.2	268.0	268.5	268.5	267.4	267.9	267.2	......	268.0	269.3	......
16	270.0	268.0	268.2	268.5	268.6	......	267.9	267.2	267.3	267.9	269.2	268.2
17	269.7	......	......	268.4	268.5	267.6	267.8	267.3	267.6	267.9	......	268.2
18	269.5	268.5	268.9	268.4	268.4	267.5	267.9	......	267.6	267.9	269.2	268.3
19	269.5	268.4	269.1	268.3	......	267.6	267.8	267.0	267.6	267.9	269.0	268.4
20	......	268.2	269.1	268.3	268.5	267.3	267.8	267.1	267.5	......	268.9	268.4
21	269.4	268.0	269.1	......	268.2	267.4	......	267.0	267.6	267.8	268.9	268.5
22	269.2	268.1	269.0	268.3	268.1	267.4	267.8	267.0	......	267.7	268.9	......
23	269.1	267.8	269.1	268.1	268.2	......	267.6	267.0	267.3	267.8	268.8	268.6
24	268.8	......	......	268.2	268.1	267.3	267.6	267.2	267.6	267.7	......	269.3
25	268.9	267.9	269.3	268.3	268.0	267.3	267.7	......	267.7	267.7	268.9	270.0
26	268.7	267.5	269.3	268.5	......	267.2	267.8	266.8	267.5	267.6	268.7	269.8
27	......	267.5	269.3	268.8	268.3	267.1	267.7	267.2	267.4	......	268.6	269.8
28	268.8	267.5	269.5	......	268.1	267.1	......	267.0	267.6	268.0	269.0	270.0
29	268.6	......	269.5	269.1	268.0	267.8	267.7	267.4	......	268.0	268.8	......
30	268.6	......	269.4	269.0	268.3	......	267.5	267.1	267.4	268.2	268.7	270.1
31	268.7	......	......	......	268.0	......	267.6	266.8	......	268.2	......	270.4

OSWEGO RIVER BELOW HIGH DAM, NEAR OSWEGO, N. Y.

High dam is the second dam above the mouth of the Oswego river and is located 1.1 miles above the curved dam. A gage was erected below this dam, April 7, 1904. The gage is a vertical board divided to feet and tenths by means of coppered staples with brass figures. It is attached to the left-hand face of a stone-filled timber crib, forming down-stream extension of the masonry abutment at the left-hand end of the dam. The zero mark on the gage is at elevation 266.07.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River below High Dam, near Oswego, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	270.2	269.8	269.8	270.8	270.0	269.0	268.5	268.3	267.5	267.9	268.9	269.7
2	270.3	269.8	269.8	270.6	270.0	268.9	268.7	268.2	267.6	267.6	268.8	269.6
3	270.3	269.6	269.7	270.5	270.0	268.9	268.7	268.1	267.9	267.7	269.2	269.6
4	271.8	269.4	269.9	270.4	270.0	268.8	268.5	267.8	268.0	267.9	269.1	269.6
5	271.4	269.5	269.9	270.4	270.0	268.8	268.7	267.9	267.5	267.6	269.1	269.5
6	271.3	269.4	269.8	270.3	270.1	268.9	268.6	267.9	267.8	268.2	269.1	269.7
7	271.6	269.4	269.9	270.6	270.0	268.8	268.6	267.9	267.8	268.3	269.6	269.2
8	271.7	269.5	270.0	270.2	269.9	268.9	268.6	267.8	268.0	268.4	270.0	269.2
9	271.7	269.5	269.6	270.6	269.9	268.8	268.5	267.8	267.6	268.3	270.1	269.6
10	271.6	269.4	269.8	270.0	269.8	268.9	268.5	267.7	267.9	268.4	270.3	269.4
11	271.4	269.4	269.6	269.9	269.8	268.8	268.5	268.1	267.9	268.4	270.6	269.6
12	271.4	269.2	269.5	269.9	269.7	268.7	268.6	267.8	267.9	268.5	270.3	269.6
13	271.2	269.2	269.5	269.9	269.9	268.6	268.5	267.8	268.0	268.8	270.3	269.6
14	271.2	269.2	269.6	269.8	269.7	268.6	268.5	267.7	268.0	268.8	270.1	269.7
15	271.1	269.1	269.8	269.8	269.6	268.4	268.5	267.7	268.0	268.6	270.1	269.3
16	271.1	269.0	270.2	269.8	269.7	268.4	268.5	267.6	267.8	268.6	270.1	269.0
17	270.6	269.1	270.4	269.7	269.6	268.6	268.5	267.8	268.0	268.6	270.0	269.0
18	270.4	269.0	270.8	269.6	269.6	268.5	268.4	267.4	268.0	268.6	270.0	269.1
19	270.8	269.0	271.0	269.5	269.4	268.4	268.4	267.5	267.9	268.5	269.9	269.1
20	270.7	269.0	270.8	269.4	269.7	268.4	268.3	267.8	267.9	268.5	269.8	269.0
21	270.6	269.0	270.7	269.6	269.4	268.3	268.2	267.5	268.0	268.7	269.8	269.2
22	270.6	268.7	270.4	269.4	269.3	268.3	268.3	267.4	268.2	268.5	269.7	269.3
23	270.3	268.8	270.4	269.3	269.2	268.0	268.2	267.4	267.8	268.5	269.7	269.4
24	270.1	269.3	270.4	269.4	269.6	268.2	268.2	267.6	268.6	268.4	269.7	270.2
25	270.1	269.5	270.8	269.5	269.0	268.2	268.5	267.5	268.6	268.4	269.7	270.5
26	270.1	269.5	270.8	269.8	268.9	268.1	268.6	267.9	268.0	268.4	269.5	270.8
27	270.1	269.5	270.7	270.0	269.4	268.0	268.4	267.6	267.8	268.4	269.4	270.8
28	270.1	269.8	270.9	270.0	269.3	268.0	268.2	267.3	268.0	268.6	269.5	271.1
29	269.9	.....	270.9	270.2	269.2	268.3	268.5	267.6	268.6	268.8	269.6	271.1
30	269.9	.....	270.9	270.1	269.6	268.5	268.5	267.4	267.9	268.9	269.6	271.6
31	269.8	.....	270.8	.....	269.1	.....	268.4	267.3	.....	268.9	.....	271.1

OSWEGO RIVER ABOVE HIGH DAM, NEAR OSWEGO, N. Y.

A record of the stage of the water above High dam has been kept since April 1, 1907. An effort was formerly made to determine the discharge from observations at this point, but owing to the undetermined leakage, this has been found impracticable. A description of the conditions may be found in Supplement to the Report of the State Engineer and Surveyor of New York for 1902, pages 91–96. Water is diverted to the Oswego canal on the right-hand bank, and for the power plants of the Oswego Water Works & Electric Light Company on the left-hand bank. Flashboards were formerly maintained on the crest of the dam in the summer season. In 1903 the crest was permanently raised by masonry. The elevation of water-surface is determined by measuring downward with a graduated rod from a reference point on the up-stream end of the left-hand abutment. The gages at High dam are read each morning by Samuel L. Purdy.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above High Dam, near Oswego, N. Y.

DAY	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	285.6	285.2	284.0	286.3	285.7	284.8	283.8	283.9	282.6	282.8	283.8	284.5
2	285.7	284.7	283.7	286.2	285.6	284.6	283.8	283.4	282.5	282.8	283.8	284.6
3	285.7	284.9	284.1	286.1	285.6	284.6	283.8	283.3	282.7	282.8	283.7	284.5
4	286.6	284.8	284.2	286.0	285.7	284.5	283.5	282.8	282.7	282.8	283.7	284.5
5	286.7	284.9	284.2	285.9	285.5	284.5	283.9	283.1	282.7	282.8	284.0	286.4
6	286.7	284.8	284.2	285.8	285.7	284.6	283.8	283.2	282.7	282.5	284.1	284.3
7	286.7	284.7	284.2	285.7	285.6	284.5	283.5	283.1	282.7	283.1	284.4	284.3
8	286.8	284.8	284.3	285.8	285.6	284.6	283.9	283.0	282.7	283.2	284.9	284.3
9	286.9	284.8	284.1	285.8	285.6	284.6	283.7	283.0	282.6	283.2	285.1	284.4
10	286.8	284.8	284.0	285.6	285.5	284.6	283.5	283.0	282.8	283.3	285.1	284.4
11	286.7	284.7	284.2	285.6	285.9	284.6	283.7	282.7	282.7	283.3	285.9	284.6
12	286.7	284.5	284.0	285.6	285.1	284.5	283.7	282.9	282.7	283.4	285.3	284.7
13	286.4	284.5	284.2	285.5	285.5	284.4	283.6	283.0	282.7	283.2	285.3	284.7
14	286.5	284.6	284.3	285.9	285.3	284.4	283.3	282.9	282.7	283.7	285.2	284.8
15	286.5	284.6	284.5	285.9	285.3	284.2	283.7	282.9	282.6	283.4	285.1	284.2
16	286.4	284.5	284.8	285.4	285.3	284.0	283.5	282.9	282.6	283.4	285.0	284.2
17	285.9	284.5	285.0	285.3	285.2	284.2	283.5	283.0	282.8	283.4	284.8	284.2
18	285.7	284.5	285.6	285.2	285.3	284.2	283.5	282.7	282.8	283.4	284.9	284.2
19	286.1	284.3	285.7	285.2	285.0	284.1	283.4	282.8	282.8	283.4	284.8	284.4
20	286.0	284.4	285.7	285.1	285.2	284.1	283.3	282.9	282.7	283.1	284.7	284.3
21	286.0	284.5	285.7	284.8	285.0	284.0	283.2	282.8	282.7	283.5	284.8	284.5
22	285.9	284.1	285.8	285.1	284.9	283.9	283.4	282.7	282.7	283.3	284.7	284.3
23	285.7	283.9	285.9	284.9	284.9	283.6	283.3	282.7	282.6	283.3	284.6	284.7
24	285.4	283.9	286.0	285.0	284.8	283.9	283.2	282.8	282.9	283.3	284.4	284.9
25	285.5	283.9	286.2	285.1	284.7	283.8	283.9	282.2	282.9	283.3	284.6	284.8
26	285.4	283.8	286.2	285.9	284.6	283.8	283.6	282.4	282.8	283.2	284.5	284.1
27	285.4	283.9	286.2	285.6	285.0	283.7	283.9	282.6	282.7	283.1	284.5	284.2
28	285.4	283.8	286.3	285.6	284.8	283.6	283.1	282.6	282.8	283.8	284.3	284.5
29	285.1	......	286.4	285.8	284.8	283.6	283.4	282.6	282.7	283.7	284.6	284.4
30	285.3	......	286.3	285.7	284.8	283.5	283.9	282.6	282.8	283.7	284.6	284.4
31	285.1	......	286.2	......	284.8	......	283.9	282.7	......	283.8	......	284.5

OSWEGO RIVER BELOW MINETTO DAM.

The dam at Minetto is located 3.5 miles up-stream from Oswego. A gage was erected by this Department, April 18, 1904, for the purpose of determining the water-elevation below the dam. During the year 1907 a weight-and-chain gage was used, the box and scale being attached horizontally to the coping of the river wall at the right-hand end of the dam. The standard datum for this gage is at elevation 286.61, the chain length being 16.00. The gage is read each morning by Roy L. Smith. Owing to the defective condition of the gage, readings for 1907 are approximate only.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River below Minetto Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	291.9	291.7	290.6	292.8	292.2	291.3	290.3	289.9	288.9	289.8	290.6	291.1
2	292.0	291.7	290.8	292.7	292.2	291.1	290.4	289.9	289.3	289.6	290.7	291.2
3	292.1	291.7	290.8	292.6	292.2	291.0	290.4	289.7	289.4	289.3	290.6	291.2
4	293.2	291.6	290.8	292.5	292.2	290.9	290.9	289.3	289.5	289.4	290.9	291.2
5	293.4	291.6	290.6	292.4	292.1	290.8	290.3	289.7	289.5	289.6	290.9	291.2
6	293.3	291.6	290.6	292.3	292.2	291.0	290.3	289.6	289.6	289.3	291.0	291.2
7	293.3	291.8	290.7	292.2	292.1	291.1	289.9	289.6	289.6	289.7	291.3	291.2
8	293.3	292.0	290.8	292.3	292.1	291.2	290.4	289.5	289.2	289.8	291.6	291.1
9	293.4	291.8	290.6	292.2	292.1	291.0	290.4	289.5	289.6	289.9	291.9	291.2
10	293.3	291.5	290.8	292.2	292.0	291.1	290.2	289.6	289.6	290.0	291.9	291.3
11	293.3	291.7	290.7	292.1	291.9	291.1	290.3	289.4	289.6	290.0	292.0	291.4
12	293.2	291.5	290.6	292.1	291.8	291.0	290.3	289.6	289.6	290.0	291.9	291.4
13	293.1	291.3	290.7	292.1	292.0	290.9	290.3	289.6	289.6	290.1	291.9	291.5
14	293.1	291.2	290.8	291.9	291.9	290.8	289.8	289.4	289.6	290.2	291.8	291.5
15	293.1	291.3	290.9	292.0	291.8	290.7	290.3	289.4	289.3	290.2	292.3	291.4
16	293.0	291.1	291.2	291.9	291.8	290.4	290.2	289.4	289.6	290.2	291.7	291.2
17	292.9	290.9	291.5	291.8	291.7	290.8	290.2	289.3	289.6	290.2	291.6	291.1
18	292.8	290.9	292.2	291.8	291.7	290.8	290.2	288.9	289.6	290.1	291.7	291.0
19	292.7	291.1	292.3	291.7	291.6	290.8	290.1	289.5	289.6	290.1	291.5	291.0
20	292.6	291.1	292.2	291.7	291.7	290.7	290.0	289.5	289.6	289.9	291.4	291.0
21	292.7	291.7	292.3	291.2	291.5	290.6	*a*	289.4	289.5	290.1	291.4	291.0
22	292.5	291.4	292.2	291.6	291.4	290.5	*a*	289.3	289.3	290.1	291.4	290.9
23	292.4	290.8	292.3	291.4	291.4	289.8	*a*	289.2	289.6	290.1	291.4	291.3
24	292.2	290.7	292.4	291.5	291.3	290.3	*a*	289.1	289.6	290.1	291.3	291.6
25	292.1	290.9	292.5	291.6	291.3	290.2	*a*	288.8	289.6	290.1	291.4	292.2
26	292.0	290.8	292.6	291.7	291.1	290.2	290.1	289.1	289.4	290.0	291.4	292.5
27	292.1	290.7	292.7	292.0	291.6	290.2	290.2	289.1	289.5	289.9	291.3	292.6
28	291.9	290.7	292.8	292.0	291.3	290.1	289.7	289.2	289.6	290.3	291.5	292.7
29	291.9	......	292.8	292.3	291.3	290.1	290.1	289.2	289.2	290.4	291.2	292.6
30	291.8	......	292.7	292.3	291.3	289.9	290.1	289.1	290.0	290.5	291.2	......
31	291.8	......	292.6	......	291.3	......	289.9	289.1	......	290.5	......	293.2

a Gage out of use.

OSWEGO RIVER ABOVE MINETTO DAM.

The gage used during 1907 has been of the weight-and-chain type, the box containing the gage scale being attached horizontally to the coping of the right-hand abutment, a few feet up-stream from the crest of the dam. The standard datum for this gage is 292.18, the chain length being 9.1 feet. The gage was established April 18, 1904, and is read each morning by Roy L. Smith. Water is diverted to the Oswego canal at the right-hand side and to the Minetto Shade Cloth Company's race at the left-hand side of the stream. Owing to the defective condition of the gage, readings for 1907 are approximately only.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Minetto Dam.

DAY.	Jan.	Feb.	March.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	301.0	300.8	299.4	301.3	300.7	300.1	299.3	299.5	298.7	299.4	299.8	300.2
2	301.0	300.8	299.6	301.2	300.7	300.0	299.4	299.5	299.0	299.2	299.9	300.3
3	301.0	300.7	299.5	301.1	300.7	300.0	299.4	299.3	299.1	298.9	299.7	300.3
4	301.9	300.6	299.6	301.0	300.7	299.9	299.7	298.9	299.2	299.0	299.8	300.3
5	302.0	300.6	299.5	300.9	300.6	299.8	299.3	299.3	299.2	299.1	299.9	300.3
6	302.0	300.6	299.5	300.8	300.7	299.9	299.3	299.2	299.2	298.9	300.0	300.3
7	302.0	300.8	299.6	300.7	300.6	299.9	299.4	299.2	299.2	299.2	300.2	300.3
8	302.1	300.7	299.7	300.8	300.6	300.0	299.8	299.1	299.0	299.3	300.5	300.2
9	302.1	300.6	299.5	300.7	300.6	299.9	299.7	299.1	299.2	299.3	300.7	300.3
10	302.0	300.5	299.5	300.7	300.5	300.0	299.5	299.2	299.2	299.3	300.7	300.3
11	302.0	300.4	299.6	300.6	300.5	300.0	299.6	299.1	299.2	299.3	300.8	300.3
12	301.9	300.3	299.5	300.6	300.4	299.9	299.6	299.2	299.2	299.3	300.7	300.3
13	301.8	300.2	299.6	300.6	300.5	299.8	299.6	299.2	299.2	299.4	300.7	300.4
14	301.8	300.2	299.7	300.4	300.5	299.7	299.3	299.0	299.2	299.6	300.6	300.4
15	301.8	300.1	299.8	300.5	300.4	299.6	299.6	299.0	*a*	299.6	300.5	300.3
16	301.8	300.1	300.1	300.5	300.4	299.4	299.5	299.0	*a*	299.5	300.5	300.2
17	301.7	300.1	300.3	300.4	300.4	299.7	299.5	298.9	*a*	299.5	300.4	300.2
18	301.6	300.7	300.7	300.4	300.4	299.7	299.5	298.7	*a*	299.4	300.5	300.1
19	301.5	300.8	300.8	300.3	300.3	299.6	299.4	299.1	299.2	299.4	300.4	300.1
20	301.5	300.8	300.8	300.3	300.4	299.6	299.4	299.1	299.2	299.3	300.3	300.1
21	301.3	300.0	300.8	300.0	300.3	299.5	299.4	299.0	299.1	299.5	300.4	300.1
22	301.0	299.9	300.8	300.3	300.2	299.5	299.5	298.9	298.9	299.5	300.4	300.0
23	301.0	299.7	300.9	300.1	300.2	299.0	299.5	298.9	299.1	299.5	300.3	300.2
24	300.9	299.5	301.0	300.2	300.1	299.4	299.4	298.8	298.1	299.5	300.2	300.5
25	300.9	299.6	301.1	300.2	300.1	299.9	299.5	298.5	299.2	299.5	300.3	300.9
26	300.8	299.6	301.2	300.3	299.9	299.3	299.5	298.8	299.0	299.4	300.3	301.1
27	301.0	299.5	301.3	300.6	300.3	299.3	299.6	298.8	299.0	299.3	300.3	301.2
28	300.9	299.5	301.3	300.6	300.1	299.2	299.2	298.9	299.1	299.6	300.2	301.3
29	300.9	......	301.2	300.8	300.1	299.2	299.5	298.9	298.9	299.6	300.2	301.2
30	300.9	......	301.2	300.8	300.1	299.0	299.5	298.9	299.4	299.7	300.2	......
31	300.8	......	301.2	......	300.1	......	299.4	298.9	......	299.7	......	301.7

a Gage out of use.

OSWEGO RIVER AT BATTLE ISLAND.

A gage was established September 14, 1900, on the Oswego river opposite Battle Island. This station was maintained by the United States Geological Survey in coöperation with this Department. The results may be found in the Supplement of the Report of the State Engineer and Surveyor of New York for 1902, pages 86–91; for 1903, pages 41–42, and for 1904, pages 512–513. The gage readings were discontinued in 1905. On May 25, 1907, a gage was erected by this Department on the right-hand bank of the Oswego river opposite Battle Island and directly across the stream from the former gage. Readings of this gage have been taken by Smith Sharp. The zero of the gage is at elevation 302.61. The new gage consists of a vertical board, graduated to feet and tenths.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River at Battle Island.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	......	......	......	......	......	......	......	......	302.7	302.7	304.1	304 61
2	......	......	......	......	......	......	......	......	302.7	302.6	304.1	305.61
3	......	......	......	......	......	......	......	......	302.7	302.8	303.6	305.5
4	......	......	......	......	......	......	......	......	302.7	302.8	304.3	305.2
5	......	......	......	......	......	......	......	......	302.7	302.7	304.6	304.8
6	......	......	......	......	......	......	......	......	302.7	302.7	305.1	304.8
7	......	......	......	......	......	......	......	......	302.7	302.8	305.5	304.6
8	......	......	......	......	......	......	......	......	302.7	302.9	306.3	303.8
9	......	......	......	......	......	......	......	......	302.6	303.1	306.4	305.1
10	......	......	......	......	......	......	......	......	302.7	303.1	306.0	305.2
11	......	......	......	......	......	......	......	......	302.7	303.3	307.0	305.4
12	......	......	......	......	......	......	......	......	302.7	303.3	306.9	305.5
13	......	......	......	......	......	......	......	......	302.7	303.5	306.6	305.5
14	......	......	......	......	......	......	......	......	302.7	303.6	306.4	305.5
15	......	......	......	......	......	......	......	......	302.6	303.4	306.1	304.0
16	......	......	......	......	......	......	......	......	302.7	303.4	306.0	304.6
17	......	......	......	......	......	......	......	......	302.7	303.4	305.4	304.7
18	......	......	......	......	......	......	......	......	302.7	303.6	305.8	304.7
19	......	......	......	......	......	......	......	......	302.7	303.5	305.7	304.6
20	......	......	......	......	......	......	......	......	302.7	303.3	305.5	304.6
21	......	......	......	......	......	......	......	302.9	302.7	304.0	305.5	305.5
22	......	......	......	......	......	......	......	302.7	302.8	303.5	305.5	305.2
23	......	......	......	......	......	......	......	302.7	302.8	303.4	305 5	306.1
24	......	......	......	......	......	......	......	302.7	302.8	303.3	304.6	306.7
25	......	......	......	......	......	......	......	302.6	302.7	303.3	304.6	307.3
26	......	......	......	......	......	......	......	302.6	302.6	303.3	305.1	307.6
27	......	......	......	......	......	......	......	302.7	302.6	302.8	305.1	307.6
28	......	......	......	......	......	......	......	302.6	302.6	304.6	305.2	307.9
29	......	......	......	......	......	......	......	302.6	303.1	304.3	305.2	307.7
30	......	......	......	......	......	......	......	302.6	303.4	304.1	305.1	308.1
31	......	......	......	......	......	......	......	302.6	......	304.1	......	307.9

OSWEGO RIVER BELOW BATTLE ISLAND DAM.

A chain-and-weight gage was erected on the down-stream end of the right-hand abutment of the Battle Island, or Braddock's dam, April 11, 1904, by H. U. Lyon, of this Department. The gage reads decimally from zero to 9 feet, the standard elevation of the water-surface, when the gage reads zero, being 301.00, and the chain length being 11.78 feet. The gage is read each morning by Smith Sharp.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River below Battle Island Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	304.9	304.8	303.7	306.1	305.0	304.2	303.6	303.4	302.5	303.3	303.9	303.9
2	305.1	304.8	303.7	306.0	305.0	303.9	303.8	303.4	303.0	303.2	303.9	304.3
3	305.9	304.8	303.8	305.9	305.0	304.1	303.8	303.4	303.0	303.2	303.7	304.2
4	306.4	304.5	304.0	305.8	305.1	304.1	303.8	303.0	303.0	303.3	303.9	304.2
5	306.5	304.4	303.9	305.6	304.9	304.1	303.8	303.5	303.1	303.3	304.1	304.1
6	306.7	304.4	303.8	305.4	305.4	304.1	303.8	303.4	303.1	302.9	304.1	304.0
7	307.1	304.4	303.9	305.0	305.1	304.1	303.6	303.4	303.1	303.5	304.3	304.0
8	307.2	304.4	303.9	305.1	305.0	304.1	303.8	303.3	302.8	303.5	304.4	303.8
9	307.2	304.3	303.9	305.1	304.9	304.1	303.7	303.3	303.3	303.6	305.0	304.1
10	306.3	304.2	303.7	305.1	304.9	304.3	303.7	303.3	303.3	303.7	304.8	304.2
11	306.2	304.2	303.9	305.0	304.9	304.1	303.7	302.9	303.3	303.6	305.4	304.3
12	306.2	304.1	303.9	305.0	304.5	304.0	303.7	303.4	303.3	303.5	305.1	304.3
13	305.9	303.9	304.0	305.0	304.7	304.0	303.6	303.4	303.2	303.4	305.1	304.3
14	306.2	304.0	304.0	304.9	304.7	303.9	303.2	303.3	303.2	303.7	304.9	304.3
15	306.4	304.0	304.1	304.8	304.7	303.9	303.7	303.3	303.2	303.6	304.7	303.7
16	306.4	304.0	304.2	304.8	304.5	303.8	303.7	303.3	303.3	303.6	304.1	304.3
17	306.1	303.9	304.3	304.7	304.6	303.9	303.6	303.3	303.3	303.7	304.4	304.3
18	306.1	304.0	305.1	304.5	304.6	303.8	303.6	302.7	303.2	303.7	304.7	304.2
19	305.9	303.9	305.3	304.5	304.3	303.8	303.6	303.5	303.3	303.6	304.6	304.2
20	305.7	303.9	305.3	304.5	304.4	303.8	303.6	303.1	303.3	303.4	304.4	303.8
21	305.9	303.8	305.2	304.1	304.4	303.8	303.7	303.1	303.3	303.9	304.4	303.8
22	305.6	303.8	305.2	304.4	304.3	303.8	303.8	303.0	302.9	303.8	304.4	303.8
23	305.3	303.8	305.2	304.2	304.3	303.7	303.5	303.0	303.4	303.7	304.4	304.4
24	304.9	303.8	305.5	304.4	304.3	303.9	303.5	303.0	303.3	303.6	304.0	305.0
25	304.9	303.9	306.1	304.6	304.3	303.7	303.6	302.5	303.1	303.6	304.4	305.6
26	304.9	303.9	306.1	304.7	304.2	303.7	303.7	303.2	303.1	303.6	304.3	305.9
27	304.9	303.8	306.3	305.0	304.5	303.6	303.7	303.1	303.0	304.4	304.1	305.8
28	305.8	303.7	306.3	304.9	304.3	303.6	303.4	303.1	303.0	304.1	304.1	306.8
29	305.8	......	306.3	305.4	304.2	303.6	303.8	303.1	303.1	304.0	304.2	306.0
30	304.8	......	306.3	305.2	304.2	303.4	303.5	303.1	303.3	303.9	304.1	306 4
31	304.8	......	305.9	......	304.2	......	303.4	303.1	......	303.9	......	306.2

OSWEGO RIVER ABOVE BATTLE ISLAND DAM.

This gage is attached to the up-stream vertical face of the right-hand abutment of the dam. It was established April 11, 1904, by H. U. Lyon, and readings are taken each morning by Smith Sharp. The gage consists of a vertical board, subdivided to feet and tenths by coppered staples, and reads from zero to 9 feet. Water is diverted to supply the Oswego canal at the right-hand side of the stream and to the raceway of a large wood pulp mill at the left-hand side. The elevation of the zero mark of the crest gage is 306.14. The crest of the dam is at elevation about 307.00.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Battle Island Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	311.1	310.9	310.1	311.7	311.2	310.7	309.8	309.7	309.0	309.6	310.1	310.4
2	311.2	310.9	310.1	311.6	311.2	310.9	310.0	309.7	309.4	309.5	310.1	310.6
3	311.5	310.8	310.1	311.6	311.2	310.5	310.0	309.7	309.4	309.5	309.9	310.5
4	312.0	310.9	310.3	311.6	311.3	310.5	310.0	309.2	309.4	309.5	310.1	310.5
5	312.1	310.8	310.2	311.5	311.1	310.5	310.0	309.8	309.4	309.5	310.4	310.5
6	312.0	310.8	310.1	311.4	311.4	310.6	310.0	309.5	309.5	309.2	310.5	310.3
7	312.2	310.8	310.2	311.3	311.3	310.6	309.9	309.5	309.5	309.7	310.7	310.3
8	312.2	310.8	310.2	311.2	311.2	310.6	310.0	309.4	309.0	309.7	310.8	310.1
9	312.2	310.8	310.2	311.2	311.1	310.6	309.8	309.4	309.5	309.8	311.0	310.5
10	312.0	310.7	310.0	311.2	311.1	310.3	309.9	309.4	309.5	309.8	310.9	310.6
11	312.0	310.7	310.3	311.1	311.1	310.6	310.0	309.2	309.5	309.8	311.3	310.7
12	312.0	310.5	310.3	311.1	310.9	310.5	310.0	309.5	309.5	309.8	311.0	310.7
13	311.8	310.4	310.3	311.1	311.0	310.4	309.9	309.5	309.4	309.9	311.0	310.7
14	311.9	310.5	310.3	311.0	311.0	310.3	309.6	309.4	309.4	310.0	311.0	310.7
15	311.9	310.5	310.4	311.1	311.0	310.2	309.9	309.4	309.1	310.0	310.9	310.9
16	311.9	310.5	310.6	311.0	310.9	310.2	309.9	309.4	309.5	310.0	310.8	310.7
17	311.0	310.3	310.8	310.9	311.0	310.2	309.9	309.4	309.5	310.0	310.6	310.5
18	311.1	310.4	311.2	310.9	311.0	310.1	309.9	309.0	309.4	310.0	310.8	310.4
19	311.2	310.3	311.3	310.9	310.7	310.1	309.9	309.8	309.5	309.9	310.7	310.3
20	311.6	310.3	311.3	310.7	310.8	310.1	309.9	309.4	309.5	309.5	310.6	310.2
21	311.7	310.2	311.3	310.6	310.8	310.0	309.7	309.4	309.5	310.1	310.6	310.2
22	311.5	310.0	311.3	311.0	310.7	310.0	309.9	309.2	309.2	310.0	310.6	310.3
23	311.2	310.0	311.3	310.6	310.7	310.0	309.8	309.2	309.5	309.9	310.6	310.5
24	311.0	310.1	311.5	310.9	310.7	310.3	309.8	309.2	309.5	309.9	310.4	311.0
25	311.0	310.3	311.7	310.9	310.7	309.9	309.9	309.0	309.5	309.9	310.6	311.3
26	311.0	310.3	311.7	311.0	310.5	309.9	310.0	309.4	309.5	309.9	310.5	311.5
27	311.0	310.2	311.8	311.2	310.9	309.9	310.0	309.3	309.4	309.6	310.4	311.5
28	311.0	310.1	311.8	311.1	310.8	309.9	309.5	309.3	309.4	310.4	310.4	311.7
29	310.9	......	311.8	311.4	310.7	309.9	310.0	309.3	309.2	310.2	310.5	311.6
30	310.9	......	311.8	311.3	310.7	309.5	309.8	309.2	309.6	310.1	310.4	311.7
31	310.9	......	311.6	......	310.7	......	309.7	309.2	......	310.1	......	311.7

OSWEGO RIVER AT MOUTH OF BLACK, OR WATERHOUSE CREEK, FULTON, N. Y.

Black creek enters the Oswego river in the north, or lower portion of Fulton. A record of the stage of Black creek has been kept since April 9, 1904, by this Department. The stage of the water is determined by measuring down-stream from a reference point on the outer corner of a square gray stone in the west end of the north abutment of the North First street bridge, crossing Black creek between the Oswego river and the Oswego canal. The elevation of the reference point is 315.00.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River at Mouth of Black, or Waterhouse Creek, Fulton, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	311.5	313.4	311.9	312.3	311.7	310.8	310.2	309.8	......	309.5	310.2	......
2	311.5	312.9	312.2	312.0	311.7	......	310.2	309.9	......	309.5	310.3	310.9
3	311.6	......	......	312.1	311.6	310.8	310.2	310.0	309.4	309.5	......	310.7
4	312.6	312.6	312.2	311.9	311.6	310.6	......	......	309.4	309.6	310.6	310.6
5	312.6	313.5	311.9	311.9	311.7	310.6	310.3	309.9	309.4	309.6	310.6	310.5
6	......	312.7	311.9	311.8	311.7	310.4	310.2	309.5	309.5	......	310.6	310.5
7	312.7	313.0	312.0	......	311.6	310.6	......	309.5	309.5	309.9	310.6	310.4
8	312.8	313.0	311.9	311.7	311.5	310.8	310.2	309.5	......	309.8	311.0	310.3
9	312.8	313.0	311.9	311.6	311.4	......	310.1	309.5	309.8	309.8	310.9	310.6
10	312.7	......	......	311.5	311.4	310.8	310.0	309.5	309.5	309.9	......	310.6
11	312.6	312.8	312.1	311.5	311.4	310.7	310.0	......	309.4	310.0	311.5	310.7
12	312.6	312.9	311.8	311.5	......	310.5	309.9	309.8	309.5	309.9	311.3	310.8
13	......	313.1	311.8	311.4	311.5	310.4	310.0	309.5	309.4	......	311.3	310.8
14	312.4	313.1	312.0	......	311.3	310.5	......	309.5	309.5	310.1	311.1	310.8
15	312.4	312.8	312.0	311.5	311.2	310.5	310.2	309.5	......	310.0	311.1	310.2
16	312.3	312.7	312.2	311.4	311.3	......	310.0	309.4	309.8	309.8	311.0	310.6
17	312.7	......	......	311.3	311.2	310.5	310.0	309.6	......	310.0	......	310.4
18	315.3	312.9	312.6	311.2	311.1	310.2	310.0	......	309.4	310.1	311.1	310.4
19	315.0	312.7	312.3	311.2	......	310.2	310.0	309.8	309.6	309.9	311.0	310.4
20	312.5	312.4	312.1	311.1	311.2	310.2	310.9	309.5	309.4	......	310.8	310.4
21	312.2	312.3	311.8	......	311.0	310.1	......	309.4	309.5	310.2	310.8	310.4
22	312.0	......	311.8	311.1	310.9	310.2	310.1	309.4	......	309.9	310.8	310.3
23	314.0	312.1	311.9	310.9	310.9	......	310.0	309.3	309.7	309.9	310.8	310.9
24	314.0	......	......	311.1	310.9	310.4	309.9	309.3	309.5	309.8	......	311.8
25	314.1	312.2	312.2	311.2	310.9	310.1	310.0	......	309.4	310.0	310.8	311.5
26	313.9	312.0	312.2	311.4	......	310.0	310.0	309.6	309.4	309.9	310.6	312.0
27	......	311.9	312.2	311.6	311.1	310.1	310.0	309.3	309.4	......	310.6	312.0
28	313.6	311.9	312.3	......	310.8	310.0	......	309.3	309.3	310.5	......	312.0
29	313.2	......	312.3	311.7	310.9	310.1	310.1	309.3	......	310.1	310.8	312.0
30	313.4	......	312.3	311.6	......	......	310.0	309.3	309.9	310.2	310.7	312.1
31	313.4	......	......	......	310.8	......	310.0	309.3	......	310.2	......	312.1

THE OSWEGO RIVER ABOVE LOWER FULTON DAM.

The elevation of the water-surface at a point above the Lower Fulton dam is determined each morning by this Department. A vertical board gage, reading to feet and tenths, is attached to the up-stream, center angle of the upper gates of the lower river lock. The gage is located on the right-hand bank of stream, a short distance above the dam, and observations have been taken since April 9, 1904. During 1907, the readings have been taken by measuring down from a reference point on the gage at elevation 339.00.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Lower Fulton Dam at Fulton, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	334.1	333.5	332.3	334 8	334 3	333.4	332.7	331.9	......	331.7	332.7	......
2	334.2	333.7	332.7	334 7	334.3	......	332.7	332.0	......	331.7	332.8	333.4
3	334.2	......	......	334.7	334.2	333.5	332.8	331.7	331.0	331.4	......	333.2
4	335.0	333.3	332.9	334 6	334.2	333.2	......	......	329.9	331.5	332.9	333.1
5	335.1	333.3	332.7	334.5	......	333.2	332.9	332.3	331.5	331.7	333.0	333.0
6	......	333.2	332.7	334.3	334.3	333.3	332.6	330.5	331.8	......	333.0	332.9
7	335.3	333.4	332.9	......	334.2	333.2	......	330.9	331.5	332.2	333.4	332.8
8	335.3	333.5	332.9	334.4	334.2	333.3	333.0	331.1	......	331.6	333.6	333.3
9	335.3	333.4	332.8	334.3	334.1	......	332.6	331.6	331.6	331.6	333.9	333.0
10	335.2	......	......	334.2	334.1	333.6	332.5	331.9	331.6	332.3	......	333.1
11	335.1	333.5	332.8	334.1	334.0	333.3	332.5	......	331.5	331.9	334.0	333.2
12	335.1	332.9	332.7	334.1	......	333.2	332.4	332.7	331.3	332.1	333.9	333.2
13	......	333.0	332.7	335.0	333.7	333.1	332.4	332.3	331.4	......	333.9	333.2
14	335.0	333.1	332.9	......	334.0	333.1	......	331.6	331.1	332.6	333.8	333.3
15	335.0	333.0	333.0	334 0	333.8	333.0	332.7	331.5	......	331.8	333.8	333.4
16	334.9	333.0	333.3	333.9	334.0	......	332.5	331.5	331.9	331.3	333.7	332.9
17	334.7	......	......	333.9	333.9	333.1	332.3	331.8	......	331.4	......	332.7
18	334.2	332.3	334.0	333.9	333.8	332.8	332.4	......	331.3	332.3	333.7	332.8
19	334.6	332.7	334.1	333.8	......	332.7	332.3	332.5	331.8	332.3	333.4	332.5
20	335.0	332.8	334.2	333.8	333.9	332.8	332.4	331.2	331.5	......	333 4	332.5
21	334.6	332.9	334.2	......	333.6	332.7	......	331.1	331.4	332.3	333.5	332.8
22	334.4	......	334.3	333.5	333.6	332.8	332.5	331.0	......	331.9	333.3	332.5
23	334.3	332.6	334.4	333.6	333.6	......	332.4	331.5	331.5	332.3	333.2	332.5
24	333.8	......	......	333.7	333.5	332.8	332.2	331.2	331.6	332.0	......	334.0
25	333.9	332.8	334.6	333.8	333 6	332.6	332.3	......	331.5	332.2	333.4	334.6
26	333.7	332.5	334.7	334 0	......	332 5	332.4	332.0	331.6	332.0	333.2	334.5
27	......	332.8	334.7	334.2	333.8	332.4	332.2	332.2	331.5	......	333.2	334.4
28	333.9	332.4	334.8	......	333.5	332.4	......	331.8	331.4	332.7	......	334.8
29	333.7	......	334.8	334.3	333.7	332.5	332.4	331.8	......	332.5	333.2	335.2
30	333.7	......	334 8	334.3	......	......	332.0	331.8	332.0	332.5	333.2	334.8
31	333.7	......	......	......	333.4	......	331.8	331.7	......	332.6	......	334.9

THE OSWEGO RIVER ABOVE OSWEGO FALLS DAM.

Observations of the stage of water in the pond above the Oswego Falls, or Upper Fulton dam have been taken by this Department since April 9, 1904. A gage was formerly located on the river wall at the right-hand side of the stream, 16 feet up-stream from the crest of the dam. During 1907 readings have been taken each morning by measuring down from a reference point consisting of an arrow cut in the coping of the river wall near its up-stream end. The elevation of the reference point is 355.00. The water-elevation above the upper and lower dams in Fulton is controlled by mills. These mills have capacity sufficient to utilize the entire flow in ordinary or low stages of the stream.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Oswego Falls Dam, Fulton, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	349.2	349.0	348.5	349.8	349.8	348.6	347.4	347.6	......	......	347.4	......
2	349.4	348.8	347.7	349.8	349.7	......	347.4	347.5	......	347.5	347.5	349.0
3	349.6	......	......	349.7	349.7	348.7	347.5	347.3	347.6	347.6	......	348.7
4	350.5	349.6	348.0	349.7	349.7	348.3	......	......	347.6	347.6	348.1	348.6
5	350.4	349.0	347.5	349.6	......	348.4	347.9	347.7	347.6	347.6	348.0	348.5
6	......	348.4	347.9	349.5	349.7	348.3	347.6	347.2	347.8	......	348.0	348.5
7	350.4	348.6	348.2	......	349.6	348.4	......	347.7	347.8	347.5	348.6	348.4
8	350.5	349.1	348.1	349.4	349.6	348.6	347.6	347.6	......	347.8	348.6	348.8
9	350.4	349.2	348.0	349.6	349.6	......	347.1	347.1	347.7	347.7	349.3	348.8
10	350.3	......	......	349.6	349.4	348.6	347.2	347.2	347.7	347.9	......	348.5
11	350.3	349.4	347.7	349.4	349.4	348.4	347.0	......	347.7	347.1	349.5	348.7
12	350.2	347.8	347.6	349.4	......	348.4	347.2	347.6	347.8	347.4	349.8	348.6
13	......	349.7	347.7	349.4	349.6	348.2	347.1	347.5	347.7	......	349.3	349.0
14	350.2	348.0	347.9	......	349.4	348.1	......	347.2	347.9	347.2	349.1	349.0
15	350.2	348.1	348.2	349.3	349.4	348.2	347.2	347.5	......	347.3	349.1	349.5
16	350.1	348.0	348.6	349.3	349.3	......	347.1	347.5	347.7	347.4	349.2	348.6
17	350.9	......	......	349.3	349.4	348.1	347.0	347.5	......	347.5	......	348.6
18	350.2	349.3	349.2	349.2	349.3	347.8	347.0	......	347.4	347.5	349.0	348.1
19	350.2	349.3	349.2	349.2	......	347.8	346.9	347.7	347.5	347.3	348.8	348.0
20	350.7	347.8	349.2	349.2	349.3	347.4	347.0	347.6	347.8	......	348.8	348.0
21	350.5	347.8	349.3	......	349.0	347.4	......	347.8	347.4	347.3	349.0	348.5
22	......	......	349.4	349.0	349.0	347.8	347.2	347.3	......	347.3	348.9	349.4
23	350.2	347.9	349.6	349.0	349.0	......	346.9	347.5	347.6	347.3	348.7	349.2
24	349.5	......	......	349.0	348.9	347.4	346.9	346.6	347.7	347.3	......	349.4
25	349.9	348.0	349.7	349.2	348.9	347.5	346.9	......	347.5	347.4	348.9	349.6
26	349.2	349.0	349.7	349.4	......	347.3	347.0	347.7	347.8	347.2	348.8	349.5
27	......	348.7	349.8	349.6	349.2	347.0	347.2	347.3	347.6	......	348.6	349.8
28	349.2	348.8	349.9	......	349.1	347.2	......	347.8	347.7	347.6	......	349.9
29	349.4	......	349.9	349.8	348.7	......	347.2	347.7	......	347.3	348.9	350.6
30	349.0	......	349.9	349.8	......	......	347.6	347.7	347.5	347.4	348.8	350.1
31	......	......	......	......	348.6	......	347.5	347.7	......	347.6	......	350.0

THE OSWEGO RIVER AT THE MOUTH OF OX CREEK.

Ox creek enters the Oswego river four miles south, or up-stream from Fulton and on the left-hand side. A gage was established at the highway bridge just above the mouth of Ox creek, April 12, 1904, by this Department. A vertical gage, graduated decimally by copper staples and reading from zero to 9 feet, is used. The gage is attached to the down-stream side of the bridge near the left-hand abutment. The elevation of the zero mark is 347.81. Lock No. 7, or Morseman's lock, is located across the river from Ox creek. A bench-mark is located on this lock at elevation 354.53.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River at Mouth of Ox Creek.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	350.8	353.4	350.8	351.8	351.1	349.8	348.6	348.4	......	347.7	348.6	......
2	350.8	352.9	350.9	351.7	351.1	......	348.5	348.3	347.7	347.5	348.6	349.8
3	351.0	......	......	351.6	351.1	349.7	348.4	348.3	347.4	348.0	......	349.6
4	352.3	352.0	351.0	351.5	351.2	349.5	348.4	......	347.6	347.9	349.0	349.5
5	352.4	351.9	350.9	351.4	......	349.4	349.2	348.3	347.7	347.9	349.0	349.5
6	......	351.8	350.8	351.4	351.1	349.5	348.6	348.0	347.7	......	349.4	349.4
7	352.4	352.3	351.0	......	351.0	349.6	......	347.9	347.7	348.1	349.6	349.4
8	352.4	352.2	350.8	351 2	350.9	349.7	348.6	347.9	......	348.0	350.3	....
9	352.6	352.1	350.8	351.1	350.9	......	348.3	347.7	347.7	348.0	347.7	349.3
10	352.5	......	......	351.0	350.8	349.7	348.2	347.9	347.6	348.0	......	349.6
11	352.4	351.8	350.7	350.9	350.8	[a]349.6	348.1	......	347.6	348.1	350.8	349.8
12	352.3	351.2	350.5	350.9	......	[a]349.4	348.2	348.0	347.7	348.1	350.7	350.0
13	......	351.4	350.4	350.9	350.9	[a]349.3	348.2	347.9	347.7	......	350.6	350.0
14	352.3	351.5	350.5	......	350.7	349.2	......	347.6	347.7	348.4	350.5	350.0
15	352.2	351.4	350.6	350.8	350.6	349.2	348.3	347.6	......	348.2	350.4	......
16	352.1	351.2	350.7	350.6	350.6	......	348.1	347.7	347.6	348.1	350.3	349.3
17	352.1	......	......	350.5	350.6	[a]349.3	348.0	347.8	347.7	348.1	......	349.1
18	352.2	351.2	351.3	350.5	350.5	348.9	347.9	......	347.6	348.1	350.2	349.2
19	352.2	351.5	351.2	350.4	......	348.8	347.6	348.0	347.7	348.0	349.9	349.3
20	......	351.1	351.0	350.3	350.5	348.7	347.8	347.9	347.7	......	349.8	349.2
21	352.0	350.8	351.1	......	350.4	348.6	......	347.9	347.7	348.3	349.7	349.2
22	351.1	351.0	351.3	350.2	350.3	348.6	348.2	347.7	......	348.0	349.7	....
23	351.7	350.9	351.4	350.0	350.0	......	347.9	347.6	348.0	347.9	349.7	349.8
24	353.8	......	......	350.2	349.9	348.7	347.9	347.5	347.9	347.9	......	350.8
25	354.2	350.8	351.6	350.4	349.8	348.5	348.1	......	347.9	347.9	349.7	351.3
26	355.1	350.9	351.7	350.8	......	348.4	348.1	347.9	347.9	347.9	349.4	351.4
27	......	350.9	351.7	351.1	350.3	348.2	348.1	347.4	348.0	......	349.4	351.5
28	354.7	350.8	351.9	......	350.0	348.1	......	347.5	347.9	348.6	349.7	351.8
29	353.9	......	351.6	351.3	349.9	348.1	348.8	347.6	......	348.5	349.8	......
30	353.9	......	351.8	351.1	350.0	......	348.5	347.7	347.9	348.5	349.8	352.0
31	353.6	......	......	......	349.9	......	348.4	347.7	......	348.6	......	351.8

OSWEGO RIVER BELOW SITE OF OLD HORSESHOE DAM.

The gage at this station was erected April 13, 1904. It is located on the right-hand bank of the Oswego river on a strip of land between the river and Oswego canal, a short distance below guard-lock No. 2. The readings are taken by means of a weight and chain in conjunction with a horizontal scale. The scale is attached at one end to a large buttonwood tree. The other end projects over the water. The gage was defective during the greater part of the year 1907 and the readings are approximate only. The gage was repaired in December, 1907. Readings are taken usually about noon each day by Frank M. Hughes.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River below site of Old Horseshoe Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	351.1	......	352.8	352.1	351.4	349.9	348.7	348.6	......	347.9	348.7	......
2	351.1	353.1	352.5	351.9	351.3	349.8	348.6	348.4	348.2	347.9	348.7	349.9
3	351.4	......	......	351.8	351.4	349.8	348.7	348.4	347.9	347.9	......	......
4	352.7	354.6	352.5	351.6	351.4	349.7	349.5	......	347.8	......	349.2	......
5	352.6	354.5	352.6	*a*	......	349.6	349.0	348.6	347.9	......	349.2	......
6	......	358.4	352.6	*a*	351.3	349.6	348.8	348.1	347.9	......	349.2	......
7	352.7	359.3	352.5	*a*	351.2	349.8	......	348.0	347.9	347.8	349.7	349.5
8	352.8	357.9	352.3	*a*	351.1	349.9	349.1	348.1	......	348.2	350.4	......
9	352.9	356.6	352.1	*a*	351.0	......	348.5	348.1	348.0	348.1	350.7	349.1
10	352.8	......	......	*a*	350.9	349.8	348.4	348.0	347.9	348.0	350.9	349.3
11	352.7	354.1	351.9	*a*	351.0	......	348.4	......	347.9	348.2	350.6	349.8
12	352.7	354.1	351.5	*a*	......	349.7	348.3	348.3	347.9	348.4	350.6	350.1
13	......	354.0	351.3	*a*	350.0	349.6	348.2	348.2	347.9	......	350.6	350 1
14	352.4	353.9	351.3	*a*	350.8	349.5	......	348.0	348.0	348.5	350.5	350.2
15	352.4	353.9	351.2	*a*	350.8	349.4	348.5	347.9	......	348.5	350.5	......
16	352.5	353.8	351.2	350.8	350.7	......	348.3	347.9	348.2	348.3	......	349.3
17	352.7	......	......	350.8	350.7	349.2	348.3	347.9	348.0	348.3	......	349.2
18	352.4	353.4	351.2	350.7	350.7	349.0	348.3	......	348.0	348.4	350.6	349.3
19	352.2	353.4	351.1	350.6	......	348.9	348.2	348.1	347.9	348.4	350.1	349.4
20	......	352.8	351.1	350.5	350.5	348.8	348.1	348.0	347.8	......	349.9	349.5
21	352.3	352.3	351.1	......	350.3	348.8	......	348.0	347.8	348.4	350.1	349.7
22	352.0	352.8	351.2	350.3	350.2	348.8	348.5	347.7	......	348.0	350.1	......
23	......	352.7	351.5	350.3	350.2	......	348.1	347.5	348.2	348.0	350.0	350.2
24	354.3	......	......	350.3	350.1	348.8	348.3	347.3	348.0	348.0	......	351.1
25	354.4	352.5	351.8	350.5	350.1	348.6	348.4	......	348.0	348.0	349.8	351.3
26	355.3	352.5	351.8	351.0	......	348.6	348.4	347.9	348.0	347.9	349.7	351.7
27	......	352.5	351.8	351.4	350.4	348.2	348.3	......	348.0	......	349.6	351.9
28	......	352.6	352.1	......	350.0	348.3	......	348.0	348.0	348.2	349.6	352.1
29	......	......	352.1	351.4	350.1	348.3	348.9	347.9	......	348.5	349.7	......
30	......	......	352.1	351.4	350.0	......	348.6	347.9	347.9	348.6	349.9	352.3
31	......	......	......	......	350.0	......	348.6	347.9	......	......	......	352.2

a Gage broken down.

OSWEGO RIVER ABOVE SITE OF OLD HORSESHOE DAM.

A gage consisting of horizontal scale with weight and chain was erected a short distance above guard-lock No. 2, April 13, 1904. One end of the gage box projects horizontally over the water. The gage was defective during the greater portion of 1907 and the readings are approximate only. Repairs were made near the end of the year. The observer is Frank M. Hughes. Readings are usually taken about noon each day. The elevation of the datum of this gage, as well as that of the gage below, is determined from a bench-mark on guard-lock No. 2, having an elevation 360.91.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above site of Old Horseshoe Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	352.3	355.4	354.0	353.5	352.7	351.4	350.5	350.2	.....	349 6	350.5	.....
2	352.4	353.5	353.7	353.3	352.6	.....	350.5	350.1	349.5	349.5	350.5	351.1
3	352.7	.....	.....	353.1	352.6	351.3	350.5	350.1	349.4	349.5	.....	.....
4	354.0	355.8	353.5	353.1	352.7	351.2	350.5	.....	349.3	349.5	350.6	.....
5	353.9	356.1	353.6	353.0	.....	351.2	350.6	350.0	349.4	349.5	350.7	.....
6	.....	.....	353.6	352.8	352.6	351.2	350.5	349.9	349.4	.....	350.8	.....
7	354.0	.....	353.5	.....	352.5	351.3	.....	349.9	349.4	349.8	351.2	350.8
8	354.2	.....	353.3	352.8	352.4	351.3	350.4	349.9	.....	349.9	351.6	.....
9	354.2	.....	353.0	352.6	352.3	.....	350.4	349.9	349.5	349.9	351.9	350.7
10	354.1	.....	.....	352.5	352.2	351.3	350.4	349.8	349.5	349.9	.....	350.9
11	354.0	354.4	352.6	352.5	352.2	.....	350.4	.....	349.5	350.0	352.0	351.1
12	354.0	354.6	352.1	352.5	.....	351.2	350.4	350.0	349.4	350.1	351.8	351.2
13	.....	354.6	351.9	352.4	352.2	351.1	350.3	349.9	349.4	.....	351.7	351.2
14	353.8	354.5	351.9	.....	352.1	351.0	.....	349.8	349.4	350.1	351.7	351.3
15	353.8	354.1	351.9	352.2	352.1	350.9	350.3	349.8	.....	350.2	351.6	.....
16	353 9	354.0	352.0	352.2	352.0	.....	350.2	349.8	349.5	350.2	351.6	350.7
17	353.9	.....	.....	352.1	352.0	350.9	350.2	349.8	349.4	350.1	.....	350.6
18	353.7	353.6	352.6	352.0	351.9	350.9	350.2	.....	349.4	350.1	351.4	350.7
19	353.3	353.7	352.5	351.9	.....	350.8	350.2	349.8	349.4	350.1	351.3	350.8
20	.....	353.4	352.5	351.8	351.8	350.7	350.2	349.8	349.4	.....	351.3	350.8
21	353.3	353.4	352.5	.....	351.7	350.7	.....	349.8	349.4	350.1	351.4	350 9
22	353.1	354.2	352.5	351.6	351.6	350.6	350.2	349.7	.....	350.0	351.3	.....
23	.....	354.0	352.8	351.6	351.6	.....	350.2	349.7	349.7	350.0	351.3	351.3
24	354.8	.....	.....	351.7	351.5	350.7	350.2	349.6	349.6	350.0	.....	352.1
25	354.8	353.8	353.2	351.9	351.5	350.6	350.3	.....	349.5	350.0	351.0	352.5
26	355.6	354.2	353.2	352.4	.....	350.5	350.3	.....	349.5	349.9	350.9	352.8
27	356.1	353.9	353.3	352.6	351.8	350.3	350.2	.....	349.5	.....	350.9	353.0
28	356.0	354.0	353.5	.....	351.4	350.3	.....	.....	349.5	350.1	350.9	353.2
29	356.1	.....	353.5	352.7	351.5	350.3	350.3	.....	.....	350.3	351.0	....
30	355.9	.....	353.5	352.7	351.4	.....	350.2	.....	349.7	350.3	351.1	353.2
31	355.8	.....	.....	.....	351.4	.....	350.2	349.5	.....	350.4	.....	353.4

OSWEGO RIVER AT HINMANSVILLE BRIDGE.

This gage is located on the down-stream side of the left-hand span of the bridge crossing Oswego river at Hinmansville, N. Y. The gage is of the chain-and-weight type. The gage box is attached horizontally to the bridge floor outside the hand-railing and the scale is graduated from zero to nine feet. The standard datum of this gage is 348.643. Length of chain is 19.95 ft. The gage was established April 13, 1904, and is read each day about noon by Frank M. Hughes. The gage is located near lock No. 6 on the Oswego canal. A bench-mark on this lock is at elevation 361.69. Current-meter measurements were formerly made at this bridge, but as the stream is obstructed by grass at times and there are other objectionable features, these measurements have not been continued.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River at Himmansville Bridge.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	353.9	356.1	351.6	355.3	354.5	352.9	351.7	351.2	349.8	350.5	351.8	*a*
2	354.0	355.0	354.1	355.1	354.4	352.8	351.6	351.0	350.3	350.5	351.9	*a*
3	354.3	354.6	354.1	354.8	354.4	352.8	351.6	351.0	350.3	350.5	351.8	*a*
4	356.0	356.4	354.1	354.6	354.4	352.7	351.5	350.6	350.1	350.5	352.2	*a*
5	355.9	356.3	354.2	354.8	354.3	352.7	351.8	351.0	350.3	350.5	352.2	*a*
6	356.1	349.7	354.2	354.6	354.4	352.7	351.7	350.8	350.3	350.2	352.3	352.3
7	356.1	349.8	354.1	354.5	354.2	352.7	351.5	350.7	350.3	350.9	352.8	352.2
8	356.3	349.6	353.8	354.6	354.2	352.8	351.6	350.7	350.0	350.9	353.3	352.0
9	356.3	357.3	353.5	354.4	354.1	352.8	351.5	350.6	350.5	350.9	353.7	352.3
10	356.2	356.1	353.2	354.2	353.9	352.8	351.5	350.7	350.4	351.1	353.8	352.6
11	356.1	355.6	353.2	354.2	353.9	352.8	351.4	350.5	350.4	351.1	353.9	352.8
12	356.1	355.8	352.8	354.2	354.0	352.6	351.5	350.7	350.4	351.6	353.8	352.8
13	356.0	355.8	352.7	354.1	353.9	352.5	351.4	350.7	350.3	351.2	353.8	352.9
14	355.8	355.7	352.7	353.9	353.9	352.4	351.2	350.5	350.4	351.5	353.5	353.0
15	355.8	355.3	353.0	353.9	353.8	352.3	351.5	350.6	350.0	351.3	353.5	352.6
16	356.0	355.2	353.2	353.9	353.7	352.2	351.2	350.5	350.5	351.4	353.4	352.3
17	355.9	354.7	353.8	353.8	353.7	352.3	351.2	350.5	350.5	351.3	353.2	352.2
18	355.7	354.6	354.0	353.6	353.6	352.1	351.2	349.9	350.4	351.3	353.3	352.4
19	355.2	354.9	354.2	353.5	353.6	352.1	351.2	350.6	350.4	351.3	353.1	352.3
20	355.2	354.6	354.1	353.3	353.5	352.0	351.1	350.5	350.4	351.0	352.9	352.3
21	355.1	354.0	354.3	353.3	353.3	351.9	350.9	350.5	350.4	351.3	353.1	352.3
22	355.1	354.8	354.4	353.2	353.2	351.8	351.2	350.3	350.1	351.2	352.9	352.2
23	354.9	354.5	354.6	353.3	353.2	351.6	351.3	350.4	350.7	351.2	352.8	353.0
24	355.5	354.5	354.9	353.4	353.1	351.8	351.3	350.4	350.6	351.2	352.6	353.9
25	355.6	354.5	355.1	353.6	353.0	351.6	351.3	349.7	350.5	351.2	352.7	354.2
26	356.5	355.0	355.2	354.1	353.3	351.6	351.4	350.2	350.5	351.1	*a*	354.7
27	356.9	354.7	355.2	354.4	353.4	351.3	351.3	350.3	350.5	351.4	*a*	354.9
28	356.6	354.8	355.5	354.4	353.0	351.4	351.2	350.3	350.5	351.7	*a*	355.1
29	356.6	......	355.5	354.5	353.1	351.4	351.5	350.3	350.2	351.6	*a*	355.1
30	356.4	......	355.4	354.5	353.0	351.3	351.2	350.3	350.5	351.7	*a*	355.
31	356.3	......	355.3	......	353.0	......	351.3	350.3	......	351.8	......	355.1

a No record.

OSWEGO RIVER BELOW PHŒNIX DAM.

A gage was established April 16, 1904, by this Department and readings are taken about noon each day by George Archambeau. The gage at present used is a vertical scale divided decimally by coppered staples from zero to nine feet. It is attached to the down-stream side of the Pendergast Mill on the right-hand bank of the river. The gage zero is at elevation 352.95. The gage is located 255 feet down-stream from the right-hand end of the dam.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River below Phœnix Dam, Phœnix, N. Y.

DAY.	Jan.	Feb.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	356.2	357.5	356.9	358.2	356.7	......	353.6	353.3	353.2	353.1	353.8	353.9
2	356.6	356.4	355.9	357.9	356.7	......	353.6	353.3	353.2	353.1	353.9	355.0
3	357.4	......	......	357.7	356.8	354.8	353.6	353.2	353.1	353.0	......	354.8
4	358.6	357.7	355.7	357.6	......	354.6	353.4	......	353.1	353.0	354.4	354.6
5	358.8	357.5	355.4	357.3	356.7	354.7	353.5	353.1	353.2	353.1	354.7	354.6
6	......	357.7	355.4	357.1	356.7	354.7	353.6	353.1	353.2	......	355.2	354.4
7	358.9	360.2	355.4	356.9	356.6	354.7	......	353.0	353.2	353.2	355.4	354.3
8	359.1	359.3	355.7	356.8	356.4	354.8	353.5	353.1	......	353.2	355.5	......
9	359.2	358.2	355.5	356.6	356.4	......	353.3	353.0	353.2	353.2	356.0	354.6
10	359.2	......	......	356.5	356.3	354.8	353.2	353.1	353.2	353.2	......	354.7
11	359.1	358.7	354.8	......	......	354.8	353.1	......	353.2	353.3	356.2	354.8
12	359.0	359.2	354.2	356.5	356.3	354.6	353.2	353.1	353.2	353.4	356.2	355.0
13	......	359.8	354.3	356.4	356.2	354.5	353.3	353.1	353.2	......	356.2	355.2
14	358.7	358.9	354.3	......	356.1	354.3	......	353.2	353.2	353.4	356.2	355.3
15	358.6	358.7	354.6	356.4	355.9	354.2	353.4	353.2	......	353.4	355.9	......
16	358.3	358.3	355.1	356.4	355.9	......	353.3	353.2	353.2	353.3	355.6	354.3
17	358.3	......	......	356.0	355.8	354.2	353.3	353.2	353.2	353.3	......	354.1
18	358.0	355.0	355.6	355.9	......	354.1	353.3	353.2	353.2	353.2	355.6	354.4
19	357.7	355.1	356.1	355.6	355.6	354.1	353.3	353.1	353.2	353.2	355.7	354.6
20	......	355.1	356.5	355.3	355.4	353.9	353.2	353.2	353.1	......	355.8	354.6
21	358.8	354.7	356.8	......	355.3	353.8	......	353.2	353.1	353.4	355.8	354.5
22	357.8	354.7	356.9	355.4	355.2	353.7	353.3	353.2	......	353.3	355.9	354.9
23	357.7	356.5	357.1	355.4	355.2	......	353.3	353.2	353.2	353.3	355.9	355.2
24	357.8	......	......	355.5	355.1	353.5	353.2	353.2	353.2	353.3	......	356.3
25	357.7	358.6	357.7	355.4	......	353.6	353.3	353.0	353.1	353.4	355.8	356.5
26	357.5	358.6	357.8	356.3	355.6	353.5	353.3	353.2	353.2	353.4	355.8	356.8
27	357.7	357.9	357.8	356.7	355.2	353.5	353.2	353.2	353.2	......	355.8	357.4
28	357.7	357.9	358.0	......	355.2	353.5	......	353.2	353.2	353.4	355.8	358.0
29	357.7	......	358.2	356.9	355.1	353.5	353.3	353.0	......	353.6	355.8	......
30	357.6	......	358.2	357.8	355.0	......	353.3	353.0	353.2	353.6	355.9	358.1
31	357.6	......	......	......	355.0	......	353.3	353.1	......	353.8	......	358.1

OSWEGO RIVER ABOVE PHŒNIX DAM.

Observations of the stage of water in the pond above Phœnix dam have been taken by George Archambeau about noon each day, beginning April 16, 1904. The gage at present used is a vertical scale graduated to feet and tenths by copper staples and reading from zero to nine feet. It is attached to the west side of the bulkhead wall, 105 feet east of the east, or right-hand end of the dam. The gage is a few feet above the line of the crest of the dam and is in the entrance of the hydraulic canal. The zero mark is at elevation 357.29. The crest of the dam is at elevation about 359.13. Datum of this gage, as well as that of the gage below, is determined from a bench-mark on the Phœnix guard-lock, the elevation of which is 365.40. Water is diverted to mills at both ends of the dam. Flash-boards are placed on the dam at times. During extreme high water the dam is submerged by back-water from below.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Dam at Phœnix, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	362.2	362.3	360.6	362.3	361.7	......	361.6	361.2	360.6	361.0	361.8	......
2	362.6	362.0	360.4	362.2	361.7	......	361.7	361.2	360.6	360.9	361.8	362.1
3	362.7	......	......	362.0	361.7	361.2	361.7	361.2	360.5	360.9	......	362.1
4	363.2	362.1	360.5	361.9	......	361.2	361.9	......	360.3	361.0	362.0	362.0
5	363.4	362.4	360.2	361.9	361.7	361.2	361.7	361.2	360.6	361.0	362.1	362.0
6	......	361.9	360.6	361.8	361.7	361.2	361.6	361.1	360.6	......	362.1	361.9
7	363.4	362.1	360.6	361.8	361.6	361.2	......	361.1	......	361.1	362.3	361.9
8	363.6	361.9	360.4	361.7	361.6	361.4	361.7	361.0	......	361.2	362.6	......
9	363.6	361.6	360.4	361.6	361.5	......	361.5	360.7	360.8	361.3	362.7	361.8
10	363.6	......	......	361.5	361.4	361.3	361.4	360.5	360.8	361.4	......	362.1
11	363.6	361.4	360.4	361.5	......	361.2	361.4	......	361.0	361.4	362.8	362.2
12	363.5	361.3	360.4	361.5	361.4	361.1	361.4	361.5	361.0	361.5	362.8	362.3
13	......	361.5	360.4	361.4	361.4	361.1	361.3	361.2	361.0	......	362.8	362.3
14	363.5	361.4	360.6	......	361.3	361.0	......	361.0	361.1	361.6	362.7	362.3
15	363.3	361.3	360.7	361.4	361.4	361.0	361.4	360.9	......	361.6	362.5	......
16	363.2	361.1	361.0	361.4	361.5	......	361.3	360.7	361.0	361.6	362.4	361.9
17	363.2	......	......	361.3	361.3	360.8	361.3	360.5	360.9	361.6	......	361.8
18	363.1	361.0	361.3	361.3	......	360.7	361.3	......	360.9	361.5	362.4	361.9
19	362.8	361.8	361.5	361.1	361.2	360.7	361.2	360.6	361.0	361.5	362.2	362.0
20	......	361.0	361.5	361.0	361.0	360.8	361.2	360.4	361.0	......	362.2	362.0
21	362.7	361.0	361.6	......	361.0	360.6	......	360.3	361.0	361.6	362.2	361.9
22	362.8	361.0	361.7	361.0	361.0	360.7	361.3	360.3	......	361.5	362.2	......
23	362.5	360.9	361.8	361.1	360.9	......	361.2	360.3	361.1	361.5	362.1	362.3
24	362.4	......	......	361.1	360.8	361.4	361.1	360.4	361.0	361.5	......	362.7
25	362.4	360.9	362.1	361.2	......	361.4	361.2	......	360.8	361.4	362.1	363.0
26	362.2	360.8	362.0	361.5	361.0	361.6	361.3	360.8	360.6	361.4	362.1	363.2
27	362.1	360.8	362.2	361.7	360.9	361.5	361.4	360.6	360.5	......	362.0	363.3
28	362.1	360.6	362.2	......	360.9	361.5	......	360.5	360.2	361.7	362.0	363.4
29	362.6	......	362.3	361.7	360.9	361.6	361.3	360.3	......	361.6	362.2	......
30	361.8	......	362.4	361.7	360.9	......	361.2	360.3	361.0	361.7	362.2	363.5
31	361.9	......	......	361.7	361.0	......	361.3	360.3	......	361.8	......	363.5

GAGES ON ONEIDA LAKE AND RIVER.

Oneida lake has a water-surface area of 80 square miles and lies at an elevation of 370 feet above tide. The drainage basin within a radius of 10 miles to the south and west is relatively flat, with numerous swampy tracts. The lake receives, through Chittenango and Oneida creeks, drainage from an extensive area of the central New York plateau and, through Wood and Fish creeks on the east, drainage from a portion of the west slope of the plateau bordering the Adirondack mountains. On the north the drainage area is less extensive and the inflowing streams are small.[a]

The outflow from the lake through Oneida river joins Seneca river at Three River Point, forming Oswego river. From Brewerton to Three River Point the distance, in a straight line, is but eight miles; following the windings of the stream it is sixteen miles.

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[a] A portion of the drainage area is shown on the Syracuse, Chittenango, Oneida, Oriskany, Morrisville, Cazenovia and Tully topograghic atlas sheets of the United States Geological Survey.

Gages for Determining Elevation of Water-surface on Oneida River.

LOCATION.	DISTANCE IN MILES.* Place to place.	DISTANCE IN MILES.* From Three River Point.	Usual time of reading gage.	Present type of gage.
Three River Point	0	0	7 a. m.	Board with coppered staples
Below Oak Orchard dam	5.3	5.3	6 a. m.; 7 p. m.	Board with coppered staples
Above Oak Orchard dam	0	5.3	6 a. m.; 7 p. m.	Board with coppered staples
Below Caughdenoy lock	7.4	12.7	8 a. m.	Board with coppered staples
Above Caughdenoy lock	0	12.7	8 a. m.	Board with coppered staples
Brewerton	4.0	16.7	8 a. m.	Board with coppered staples
Sylvan Beach	21.6	38.3	8 a. m.	Graduated board.

* Measured along course of stream on U. S. Geological Survey topographic map.

ONEIDA RIVER AT THREE RIVER POINT.

A vertical gage is attached to the right-hand side of the upstream end of the pier nearest the left-hand bank of Oneida river on the highway bridge crossing the river at Three River Point. This gage is so located as to show the water-level at the mouths of Oneida and Seneca rivers, and at the head of Oswego river. The gage is graduated decimally from zero to nine feet and has been read each morning by J. Chamberlain, beginning April 16, 1904. The datum of the gage during 1907 has been 359.169. A benchmark on the highway bridge is at elevation 367.10.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River at Three River Point.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	363.57	363.47	362.17	364.37	363.87	362.27	361.97	361.67	360.77	361.17	362.27	361.97
2	363.67	363.27	361.87	364.17	363.37	362.27	362.17	361.67	361.17	360.97	362.27	362.67
3	363.87	363.47	361.87	364.27	363.27	362.27	362.07	361.67	360.97	361.17	362.47	362.67
4	364.87	363.47	361.87	363.87	363.37	361.87	362.07	361.67	360.67	361.17	362.47	362.47
5	365.07	363.57	362.07	363.77	363.47	362.07	362.27	361.77	360.97	361.17	362.47	362.57
6	365.27	363.27	362.07	363.67	363.47	361.87	362.27	361.47	361.17	361.37	362.57	362.47
7	365.27	363.37	361.67	363.77	363.27	361.97	362.07	361.47	361.17	361.57	362.87	362.47
8	365.37	363.37	361.57	363.67	363.27	362.07	362.17	361.47	361.27	361.47	363.27	362.67
9	365.47	363.27	361.47	363.47	363.17	362.27	361.87	361.47	361.57	361.47	363.57	362.57
10	365.37	362.87	361.67	363.37	363.07	362.27	361.77	361.87	361.17	361.67	363.67	362.57
11	365.27	362.67	361.47	363.27	363.07	362.07	361.77	361.87	361.17	361.67	363.77	362.77
12	365.27	362.67	361.37	363.17	363.17	361.87	361.77	361.77	361.27	361.67	363.67	362.87
13	365.27	362.77	361.47	363.17	363.17	361.77	361.67	361.57	361.37	361.97	363.97	362.87
14	365.17	362.67	361.77	363.27	362.97	362.07	361.97	361.47	361.27	362.17	363.87	362.97
15	365.07	362.57	361.97	363.17	362.87	362.07	361.97	361.27	361.47	361.97	363.47	362.47
16	364.97	362.37	362.27	363.07	362.87	361.77	361.77	361.17	361.47	361.87	363.27	362.57
17	364.87	362.27	362.77	362.97	362.77	361.77	361.67	360.97	361.27	361.87	363.17	362.47
18	364.87	363.07	363.07	362.87	362.77	361.47	361.67	361.07	361.17	361.77	362.97	362.47
19	364.87	362.47	363.37	362.77	362.87	361.37	361.67	361.17	361.27	361.87	362.87	362.47
20	364.67	362.07	363.17	362.67	362.77	361.27	361.67	360.97	361.37	361.97	362.87	362.37
21	364.57	362.37	363.27	362.67	362.67	361.17	361.87	360.77	361.27	362.07	362.77	362.37
22	364.57	362.27	363.37	362.67	362.47	362.17	361.87	360.77	361.47	361.67	362.77	362.57
23	364.27	362.27	363.57	362.57	362.47	362.37	361.57	360.77	361.47	361.77	362.77	362.67
24	364.17	362.37	363.77	362.67	362.27	363.07	361.77	360.77	361.27	362.07	362.77	363.47
25	364.07	361.57	363.97	362.97	362.27	361.97	361.77	360.77	361.07	361.67	362.67	363.87
26	363.97	362.57	364.07	362.87	362.57	361.77	361.77	360.87	360.97	362.17	362.47	364.17
27	363.67	362.57	364.07	363.07	362.67	361.77	361.87	360.97	360.87	361.97	362.57	364.87
28	363.57	362.57	364.27	363.57	362.47	361.77	361.87	360.77	360.67	361.97	362.67	364.57
29	363.47	......	364.27	363.57	362.37	361.77	362.07	360.67	361.17	362.17	362.77	364.67
30	363.37	......	364.27	363.37	362.37	361.97	361.77	360.57	361.57	362.27	362.77	364.77
31	363.27	......	364.27	......	362.27	......	361.67	360.57	......	362.27	......	364.77

Oneida River at Schroeppel's Bridge.

The gaging station was established August 30, 1902, and is maintained by the U. S. Geological Survey in coöperation with this Department. It is located seven miles up-stream from Three River Point.

Observations of stream stage, which are taken each morning and evening by Louis McArthur, are made from a gage above Oak Orchard State dam, 0.4 mile above Schroeppel's bridge. The gage readings have been taken above the dam to avoid backwater from ice or other causes as far as possible. A calibration curve for the cross-section of the stream at Schroeppel's bridge has been obtained by current-meter measurements.

Above a certain stage the dam becomes submerged and the discharge is modified. A special rating table, deduced from measurements made during the period of submergence, is used to calculate the discharge during the high-water period. Allowance is made for the opening of lock-paddles in winter, and for flashboards when used.

Current-meter Discharge Measurements of Oneida River at Schroeppel's Bridge, Euclid P. O., N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge. [c]
		Feet. U.S.G.S.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
Mar. 14	C. C. Covert	4.65	......	913	1.70	1,550
May 15	Weeks and Niles	3.15	......	1,327	2.88	3,827
June 7	E. C. Niles	[a]4.00	......	1,111	2.50	2,772
July 30	E. C. Niles	[a][b]4.20	......	901	1.56	1,401
Aug. 19	E. C. Niles	[a][b]4.50	......	769	1.51	1,161
Sept. 19	E. C. Niles	[a][b]4.60	......	468	2.30	1,077

[a] From gage-reader's record.

[b] Add 0.4, to correct for flash-boards.

[c] To plot this measurement on curve, subtract 160 cu. ft. per sec. flowing through waste-gate in lock.

Mean Daily Discharge, Second-feet, of Oneida River at Schroeppel's Bridge, Euclid P. O., N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	3,220	3,420	1,660	6,580	4,900	*a*	1,450	1,240	574	574	1,350	2,140
2	4,900	3,420	1,660	7,360	4,740	*a*	1,570	1,300	700	616	1,350	2,070
3	6,090	3,830	1,660	7,100	4,740	*a*	1,710	1,140	574	616	1,190	2,000
4	6,580	3,620	1,660	7,100	4,520	*a*	1,570	1,140	530	616	1,400	2,000
5	6,580	3,620	1,660	6,580	4,290	*a*	1,570	1,240	530	616	1,570	1,780
6	7,100	3,220	1,660	6,330	4,520	1,350	1,450	1,350	530	658	1,780	1,640
7	7,100	3,050	1,560	6,330	4,740	1,570	1,450	1,350	530	700	2,070	1,570
8	7,880	3,050	1,560	6,090	4,740	1,570	1,350	1,350	488	700	2,470	1,710
9	7,660	2,880	1,560	5,350	4,290	1,710	1,400	1,190	530	742	2,800	2,070
10	7,360	2,880	1,560	5,600	4,520	1,710	1,400	1,140	616	949	2,890	2,470
11	7,360	2,880	1,560	5,840	4,520	1,850	1,240	1,140	700	1,040	2,980	2,630
12	7,100	2,880	1,560	5,130	4,740	1,710	1,240	1,090	700	1,040	2,890	2,140
13	7,100	2,710	1,560	3,420	4,520	1,570	1,190	919	700	1,040	2,800	1,500
14	6,840	2,370	1,560	1,560	4,520	1,450	1,140	949	700	1,090	2,800	1,300
15	6,580	2,370	1,660	1,150	4,740	1,450	1,090	949	700	1,140	2,720	1,350
16	6,580	2,230	2,230	1,150	4,520	1,450	1,040	949	700	1,090	2,630	1,410
17	7,360	2,230	2,370	1,150	4,290	1,350	949	866	616	1,040	2,470	1,560
18	7,880	2,080	2,370	1,350	4,290	1,350	907	949	742	949	2,470	1,730
19	5,840	1,910	2,540	1,560	*a*	1,350	990	919	783	824	2,290	1,730
20	5,600	1,800	2,370	2,230	*a*	1,450	1,140	866	658	783	2,290	1,730
21	5,600	1,880	2,540	1,940	*a*	1,350	1,140	866	616	783	2,290	1,610
22	5,840	1,910	3,050	1,940	*a*	1,240	1,190	700	616	783	2,210	1,660
23	5,600	1,910	4,030	2,080	*a*	1,240	1,040	700	616	783	2,140	2,160
24	5,130	2,080	4,230	2,230	*a*	1,240	990	700	574	742	2,000	2,710
25	4,680	1,910	4,680	2,370	*a*	1,240	1,040	616	446	700	2,000	3,220
26	4,450	1,800	5,600	3,050	*a*	1,240	949	574	262	700	2,000	3,720
27	4,450	1,660	5,840	3,620	*a*	1,240	919	530	616	949	1,920	4,030
28	4,450	1,560	6,090	4,680	*a*	1,240	919	446	700	1,090	1,920	4,340
29	4,450	.....	6,330	4,450	*a*	1,240	1,240	530	742	1,240	2,000	4,450
30	4,450	....	6,330	5,130	*a*	1,240	1,240	530	616	1,240	2,070	4,680
31	3,620	.....	6,580	.....	*a*	.....	1,140	530	......	1,240	......	4,130

a No record.

Monthly Discharge of Oneida River at Schroeppel's Bridge, Euclid P. O., N. Y.
[Drainage area, 1,400 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	7,880	3,220	5,982	4.27	**4.91**
February	3,830	1,560	2,543	1.82	**1.89**
March	6,580	1,560	2,945	2.10	**2.42**
April	7,360	1,150	4,015	2.87	**3.21**
May (18 days)	4,900	4,290	4,583	3.26	**3.75**
June (25 days)	1,850	1,240	1,416	1.01	**1.13**
July	1,710	907	1,217	0.869	**0.999**
August	1,350	446	930	0.664	**0.764**
September	783	262	614	0.438	**0.491**
October	1,240	574	873	0.623	**0.716**
November	2,980	1,190	2,192	1.56	**1.75**
December	4,680	1,300	2,363	1.69	**1.94**

ONEIDA RIVER BELOW OAK ORCHARD DAM.

A gage was erected by this Department, April 23, 1904, on the fender piles at the lock exit below Oak Orchard dam. The gage is graduated decimally from zero to nine feet, by means of coppered staples. Readings are taken each morning and night by Louis McArthur.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River below Oak Orchard Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	364.5	364.1	362.2	366.0	365.0	362.8	362.4	361.9	361.3	361.4	363.0	363.9
2	365.2	364.1	362.4	366 2	364.9	362.8	362.6	361.9	361.4	361.5	363.0	363.8
3	366.4	364.1	362.4	366.1	364.8	362.9	362.6	361.9	361.2	361.5	363.0	363.8
4	366.5	364.2	362.4	365.9	364.8	362.8	362.6	361.9	361.1	361.4	363.2	363.7
5	366.5	364.2	362.3	365.9	364.7	362.7	362.5	361.9	361.1	361.5	363.4	363.6
6	366.7	364.2	362.2	365.8	364.8	362.7	362.6	361.9	361.3	361.7	363.6	363.4
7	366.8	364.1	362.1	365.6	364.9	362.7	362.6	361.8	361.5	361.8	364.0	363.3
8	367.0	363.9	362.0	365.5	364.9	362.9	362.8	361.7	361.6	361.8	364.4	363.3
9	366.9	363.8	362.0	365.2	364.8	363.1	362.8	361.7	361.6	361.8	364.7	363.6
10	366.9	363.7	362.0	365.2	364.6	364.0	362.7	361.6	361.5	362.0	364.9	364.0
11	366 9	363.7	361.9	365.5	364.6	362.8	362.6	361.5	361.5	362.2	364.9	364.4
12	366.8	363.6	361.9	365.9	364.3	362.8	362.5	361.5	361.5	362.3	364.9	364.2
13	366.6	363.3	362.0	366.4	364.3	362.7	362.5	361.5	361.5	362.4	364.7	364.0
14	366.5	363.3	362.1	366.7	364.2	362.7	362.5	361.5	361.6	362.4	364.6	363.7
15	366.4	363.0	362.5	366.6	364.2	362.7	362.4	361.4	361.8	362.3	364.5	363.4
16	366.4	362.8	363.1	366.6	364.0	362.5	362.3	361.2	361.7	362.4	364.4	363.3
17	367.1	362.8	363.5	365.9	363.9	362.5	362.2	361.2	361.6	362.3	364.3	363.2
18	367.2	362.8	363.5	365.1	363.9	362.5	362.3	361.3	361.5	362.3	364.1	363.3
19	365.9	362.7	363.7	363.9	363.8	362.5	362.6	361.4	361.6	362.3	364.1	363.4
20	365.9	362.8	363.8	363.8	363.8	362.5	362.7	361.3	361.6	362.3	364.0	363.4
21	366.1	362.9	363.9	363.8	363 7	362.4	362.7	361.3	361.8	362.3	364.0	363.5
22	366.1	363.0	364.1	363.8	363.6	332.4	362.6	361.3	361.7	362.2	363.9	363.6
23	366.0	362.9	364.9	363.7	363.7	352.4	362.5	361.2	361.6	362.1	363.9	364.1
24	365.8	362.9	365.0	363.6	363.6	332.4	362.4	361.2	361.5	362.0	363.8	364.7
25	365.7	362.8	365.1	363.5	363.5	352.3	362.3	361.1	361.2	362.0	363.8	365.5
26	365.6	362.7	365.8	363.8	363.5	362.2	362.3	361.1	361.1	362.0	363.8	365.7
27	365.4	362.5	365.9	364.2	362.6	362.2	362.2	361.0	361.0	362.4	363.7	365.9
28	365.3	362.3	366.0	364.8	362.3	362.2	362.2	361.0	361.1	368.8	363.6	366.0
29	364.7	......	366.0	364.8	362.4	362.2	362.1	361.1	361.6	362.9	363.6	366.1
30	364.7	......	366.0	365.0	362.4	362.3	362.0	361.1	361.5	362.9	363.7	366.2
31	364.4	......	366.1	......	362.7	......	362.0	361.2	......	362.9	......	366.0

ONEIDA RIVER ABOVE OAK ORCHARD DAM.

Readings of the water-surface elevation above Oak Orchard dam were taken by the U. S. Geological Survey from a reference point on the lock wall, beginning August 30, 1902, as described in connection with the gagings at Schroeppel's bridge. April 23, 1904, a gage was placed on the fender piles a short distance above the entrance to the lock above Oak Orchard dam by this Department. Preceding June 5, 1907, the zero of this gage was at elevation 360.64. Beginning June 5, 1907, the datum has been at elevation 360.83. Readings are taken each morning and night by Louis McArthur. The gage is vertical and is graduated decimally by means of coppered staples.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River above Oak Orchard Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	365.74	365.84	364.74	367.24	366.54	.....	365.33	365.23	364.58	364.68	365.23	365.83
2	366.54	365.84	364.74	367.54	366.54	.....	365.43	365.28	364.73	364.73	365.23	365.78
3	367.04	366.04	364.74	367.44	366.54	.....	365.53	365.13	364.58	364.73	365.08	365.73
4	367.24	365.94	364.74	367.44	366.44	.....	365.43	365.13	364.53	364.73	365.28	365.73
5	367.24	365.94	364.74	367.24	366.34	.....	365.43	365.23	364.53	364.73	365.43	365.58
6	367.44	365.74	364.74	367.14	366.44	365.23	365.33	365.33	364.53	364.78	365.58	365.48
7	367.44	365.64	364.64	367.14	366.54	365.43	365.33	365.33	364.53	364.83	365.80	365.43
8	367.74	365.64	364.64	367.04	366.54	365.43	365.23	365.33	364.48	364.83	366.03	365.53
9	367.64	365.54	364.64	366.74	366.34	365.53	365.28	365.18	364.53	364.88	366.23	365.78
10	367.54	365.54	364.64	366.84	366.44	365.53	365.28	365.13	364.63	365.13	366.28	366.03
11	367.54	365.54	364.64	366.94	366.44	365.63	365.13	365.13	364.73	365.23	366.33	366.13
12	367.44	365.54	364.64	366.64	366.54	365.53	365.13	365.08	364.73	365.23	366.28	365.83
13	367.44	365.44	364.64	365.84	366.44	365.43	365.18	364.93	364.73	365.23	366.23	365.38
14	367.34	365.24	364.64	364.64	366.44	365.33	365.13	364.93	364.73	365.28	366.23	365.18
15	367.24	365.24	364.74	364.24	366.54	365.33	365.08	364.93	364.73	365.33	366.18	365.08
16	367.24	365.14	365.14	364.24	366.44	365.33	365.03	364.93	364.73	365.28	366.13	365.13
17	367.54	365.14	365.24	364.24	366.34	365.23	364.93	364.83	364.63	365.23	366.03	365.28
18	367.74	365.04	365.24	364.44	366.34	365.23	364.88	364.93	364.78	365.13	366.03	365.43
19	366.94	364.94	365.34	364.64	.....	365.23	364.98	364.93	364.83	364.68	365.93	365.43
20	366.84	364.84	365.24	365.14	.....	365.33	365.13	364.83	364.68	364.63	365.93	365.43
21	366.84	364.84	365.34	364.94	.....	365.23	365.13	364.83	364.63	364.63	365.93	365.33
22	366.94	364.94	365.64	364.94	.....	365.13	365.18	364.73	364.63	364.63	365.8	365.38
23	366.84	364.94	366.14	365.04	.....	365.13	365.03	364.73	364.63	364.63	365.8	365.73
24	366.64	365.04	366.24	365.14	.....	365.13	364.98	364.73	364.58	364.58	365.7	366.08
25	366.44	364.94	366.44	365.24	.....	365.13	365.03	364.63	364.43	364.53	365.7	366.38
26	366.34	364.84	366.84	365.64	.....	365.13	364.93	364.58	364.33	364.53	365.7	366.63
27	366.34	364.74	366.94	365.94	.....	365.13	364.93	364.53	364.63	364.83	365.6	336.78
28	366.34	364.64	367.04	366.44	.....	365.13	364.93	364.43	364.73	364.98	365.6	366.93
29	366.34	..	367.14	366.34	.....	365.13	365.23	364.53	364.88	365.13	365.7	366.98
30	366.34	...	367.14	366.64	.....	365.13	365.23	364.53	364.73	365.13	365.7	367.08
31	365.94	...	367.24	.....	.....	.....	365.13	364.53	.....	365.13	.....	366.83

ONEIDA RIVER BELOW CAUGHDENOY LOCK.

A vertical gage was erected by this Department on the fender piles at the left-hand side of Oneida river below Caughdenoy lock, April 22, 1904. The gage is divided decimally to feet and tenths by means of coppered staples and reads from zero to nine feet. The zero mark is at elevation 363.93. Readings of this gage and also of the gage above the lock are taken each morning by Adniram Hart.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River below Caughdenoy Lock.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	366.8	367.3	365.6	369.4	368.0	366.9	365.9	365.8	......	365.1	366.3	......
2	367.0	367.2	365.6	369.5	368.1	......	365.9	365.8	365.1	365.2	366.4	366.8
3	367.4	......	......	369.3	368.1	366.5	366.1	365.7	365.1	365.2	......	366.9
4	368.7	367.3	365.5	369.2	368.3	366.5	366.1	......	365.2	365.2	366.3	366.8
5	368.9	367.0	365.4	368.9	......	366.6	366.1	365.8	365.2	365.2	366.7	366.7
6	......	366.9	365.3	368.9	368.1	366.3	366.1	365.7	365.2	......	367.0	366.6
7	369.5	366.9	365.4	......	368.0	366.5	......	365.7	365.2	365.4	366.8	366.6
8	369.8	366.7	365.4	369.1	368.0	366.7	366.0	365.8	......	365.4	367.5	......
9	369.8	366.7	365.3	368.7	368.0	......	365.9	365.7	365.1	365.7	367.9	366.6
10	369.8	......	......	368.3	367.7	366.7	365.9	365.7	365.2	365.8	......	366.7
11	369.7	366.5	365.3	368.4	367.7	366.9	366.0	......	365.3	365.9	368.0	366.8
12	369.8	366.7	365.3	368.4	......	366.6	365.9	365.6	365.3	366.0	368.0	366.9
13	......	366.5	365.3	368.3	367.8	366.6	365.9	365.5	365.3	......	368.0	367.2
14	369.4	366.3	365.4	......	367.7	366.4	......	365.4	365.3	366.0	367.5	367.6
15	369.2	366.2	365.5	368.0	368.0	366.3	365.9	365.5	......	366.0	367.9	......
16	369.1	366.1	365.7	368.0	367.4	......	365.9	365.5	365.3	366.1	367.8	366.0
17	369.1	......	......	367.7	367.4	366.2	365.8	365.5	365.3	366.0	......	366.1
18	369.3	366.0	366.3	367.8	367.4	366.2	365.8	......	365.3	365.8	367.6	366.6
19	368.8	366.1	366.6	367.7	......	366.1	365.8	365.4	365.4	365.6	367.5	366.5
20	......	365.9	366.2	367.4	367.0	366.1	365.8	365.4	365.3	......	367.4	367.6
21	368.4	365.7	366.7	......	366.9	365.9	......	365.4	365.2	365.4	367.7	366.5
22	368.5	365.9	366.9	367.4	366.9	365.9	365.8	365.3	......	365.5	367.3	......
23	368.4	365.8	367.2	367.3	367.0	......	365.7	365.3	365.3	365.4	367.2	366.8
24	368.3	......	......	367.3	366.9	365.8	365.8	365.3	365.2	365.4	......	367.6
25	368.3	365.6	368.0	367.7	366.8	366.1	365.8	......	365.0	365.5	367.1	368.1
26	368.0	365.7	368.4	367.8	......	366.0	365.7	365.1	365.1	365.3	367.1	......
27	......	365.6	368.6	368.0	367.1	365.5	365.5	365.1	365.1	......	366.8	368.7
28	367.8	365.6	368.9	......	366.4	......	......	365.2	365.2	365.9	367.0	368.8
29	367.6	......	369.1	368.2	366.8	365.9	365.9	365.1	......	365.9	367.0	......
30	367.5	......	369.2	368.1	366.8	......	365.8	365.2	365.1	366.0	367.0	369.2
31	367.5	......	......	......	366.7	......	365.8	365.1	......	366.2	......	368.5

ONEIDA RIVER ABOVE CAUGHDENOY LOCK.

A vertical gage was erected on the fender piles at the up-stream entrance to Caughdenoy lock, April 22, 1904. The gage is divided decimally to feet and tenths by coppered staples. The elevation of the zero mark is 365.69. A fall of a few feet occurs in the Oneida river at Caughdenoy. This fall is concentrated at a series of eel weirs, forming zigzag barriers which partially obstruct the flow. The lock enables boats to pass the weirs.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River above Caughdenoy Lock.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	370.8	371.1	370.2	372.3	371.5	371.0	370.4	370.2	.....	369.3	370.8	.....
2	371.1	371.1	370.2	372.2	371.6	.....	370.4	370.2	369.3	369.4	370.8	371.1
3	371.3	.....	.....	372.2	371.6	370.7	370.5	370.0	369.3	369.5	.....	371.2
4	371.5	371.0	370.1	372.2	371.7	370.8	370.4	.....	369.3	369.4	370.7	371.4
5	372.0	370.9	370.1	372.0	.....	370.8	370.5	370.2	369.3	369.5	371.0	371.1
6	.....	370.8	370.1	372.0	371.6	370.6	370.5	370.1	369.2	.....	371.2	371.0
7	372.4	370.8	370.1	.....	371.6	370.8	.....	370.1	369.3	369.7	371.0	371.0
8	372.5	370.8	370.1	372.1	371.6	370.9	370.5	370.0	.....	369.5	371.4	.....
9	372.3	370.8	370.1	371.8	371.6	.....	370.3	370.0	369.4	370.0	371.6	371.0
10	372.5	.....	.....	371.6	371.4	370.8	370.4	370.0	369.3	370.2	.....	371.0
11	372.3	370.6	370.0	371.7	371.4	370.9	370.4	.....	369.4	370.3	371.7	371.1
12	372.5	370.5	370.2	371.7	.....	370.9	370.3	369.9	369.4	370.3	371.7	371.2
13	.....	370.6	370.2	371.6	371.5	370.8	370.3	369.8	369.5	.....	371.7	371.3
14	372.2	370.5	370.3	.....	371.4	370.7	.....	369.7	369.5	370.4	371.5	371.7
15	372.0	370.5	370.3	371.5	371.6	370.7	370.4	369.8	.....	370.3	371.7	.....
16	372.0	370.5	370.4	371.5	371.2	.....	370.3	369.8	369.5	370.4	371.6	370.6
17	372.0	.....	.....	371.3	371.3	370.6	370.3	369.7	369.5	370.4	.....	370.8
18	371.9	370.4	370.6	371.3	371.3	370.5	370.3	.....	369.7	370.0	371.5	370.8
19	371.8	370.5	370.8	371.4	.....	370.5	370.3	369.7	369.7	370.3	371.5	370.8
20	.....	370.4	370.7	371.2	371.1	370.5	370.3	369.6	369.4	.....	371.4	371.0
21	371.8	370.3	370.8	.....	371.0	370.5	.....	369.6	369.4	370.2	371.5	370.8
22	371.8	370.3	371.0	371.2	371.0	370.5	370.3	369.6	.....	370.4	371.3	.....
23	371.7	370.2	371.1	371.2	371.0	.....	370.1	369.6	369.6	370.3	371.3	371.1
24	371.6	.....	.....	371.2	370.9	370.5	370.2	369.6	369.3	370.3	.....	371.3
25	371.5	370.1	371.1	371.4	371.0	370.4	370.3	.....	368.9	370.3	.....	371.6
26	371.4	370.2	371.6	371.4	.....	370.4	370.2	369.3	369.3	370.2	371.2	.....
27	.....	370.2	371.7	371.5	371.1	369.8	370.0	369.5	369.4	.....	371.3	372.0
28	371.3	370.2	371.9	.....	370.6	.....	.....	369.4	369.4	370.4	371.0	372.1
29	371.2	.....	372.0	371.7	370.9	370.4	370.1	369.4	.....	370.5	371.2	.....
30	371.2	.....	372.1	371.6	370.9	.....	370.1	369.4	369.3	370.6	371.2	372.3
31	371.2	.....	.....	.....	370.9	.....	370.2	369.3	.....	370.8	.....	371.9

ONEIDA RIVER AT BREWERTON BRIDGE.

A gage is attached to the left-hand face of a square timber crib filled with stone, adjacent to the fender piles immediately upstream from the center pier of the swinging span of the highway bridge at Brewerton. This bridge is located close to the foot of Oneida lake and the gage shows very nearly the stage of the lake. The gage was erected April 22, 1904, and was read during 1907, each morning by W. M. Hubbard. The zero of the gage is at elevation 367.06.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River at Brewerton Bridge (Foot of Oneida Lake).

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	371.16	371.46	370.36	372.86	371.86	370.86	370.26	370.36	369.26	369.46	370.96	371.16
2	371.16	371.36	370.26	372.86	371.86	370.96	370.36	370.36	369.26	369.46	370.96	371.06
3	371.26	371.36	370.36	372.86	371.86	370.96	370.36	370.36	369.36	369.56	370.96	371.06
4	371.46	371.26	370.36	372.76	371.96	370.96	370.36	370.36	369.36	369.56	370.96	371.06
5	371.56	371.26	370.36	372.76	371.96	370.96	370.46	370.26	369.36	369.56	370.86	371.06
6	372.66	371.16	370.36	372.66	371.96	371.16	370.46	370.26	369.36	369.66	371.46	371.06
7	372.76	371.16	370.36	372.66	371.86	371.06	370.36	370.16	369.46	369.66	371.76	371.06
8	372.96	371.06	370.36	372.66	371.86	370.98	370.36	370.16	369.46	369.66	371.96	371.06
9	372.96	370.96	370.36	372.56	371.86	370.96	370.36	370.16	369.46	369.76	371.96	371.06
10	373.06	370.96	370.36	372.46	371.86	370.86	370.36	370.16	369.46	369.86	371.96	371.06
11	372.86	370.96	370.36	372.36	371.76	370.76	370.46	370.06	369.46	369.96	371.96	371.06
12	372.86	370.86	370.36	372.16	371.76	370.76	370.46	370.06	369.46	370.06	371.96	371.06
13	372.76	370.86	370.36	372.06	371.76	370.76	370.36	370.06	369.46	370.26	372.06	371.06
14	372.76	370.86	370.36	371.96	371.66	370.76	370.36	369.96	369.46	370.36	371.96	371.06
15	372.66	370.86	370.46	371.86	371.66	370.76	370.36	369.96	369.46	370.36	371.86	371.06
16	372.56	370.76	370.56	371.86	371.66	370.66	370.36	369.96	369.46	370.36	371.86	371.06
17	372.36	370.66	370.76	371.76	371.56	370.56	370.36	369.86	369.46	370.36	371.76	371.26
18	372.36	370.66	370.76	371.76	371.46	370.56	370.36	369.86	369.46	370.46	371.76	371.36
19	372.26	370.56	370.86	371.76	371.46	370.46	370.36	369.86	369.46	370.46	371.66	371.46
20	372.16	370.46	370.96	371.56	371.46	370.46	370.36	369.86	369.46	370.46	371.66	371.46
21	372.26	370.46	370.96	371.46	371.36	370.46	370.36	369.76	369.46	370.46	371.56	371.46
22	372.06	370.36	371.16	371.46	371.26	370.56	370.36	369.76	369.46	370.46	371.46	371.46
23	371.96	370.36	371.26	371.36	371.16	370.46	370.36	369.66	369.46	370.56	371.46	371.66
24	371.86	370.36	371.66	371.46	371.06	370.46	370.36	369.56	369.46	370.56	371.36	372.06
25	371.76	370.36	371.76	371.56	370.96	370.46	370.26	369.56	369.46	370.66	371.36	372.26
26	371.76	370.36	372.06	371.76	370.86	370.36	370.26	369.46	369.46	370.66	371.36	372.36
27	371.76	370.36	372.16	371.96	370.86	370.36	370.36	369.36	369.46	370.66	371.36	372.36
28	371.76	370.36	372.36	371.96	371.06	370.26	370.36	369.36	369.46	370.76	371.36	372.46
29	371.56	......	372.56	371.86	371.06	370.26	370.36	369.26	369.46	370.86	371.36	372.56
30	371 56	......	372.86	371.86	371.06	370.36	370.36	369.26	369.46	370.86	371.36	372.46
31	371.46	......	372.86	......	371.06	......	370.36	369.26	......	370.86	......	372.46

FISH CREEK AT SYLVAN BEACH.

Fish creek enters Oneida lake at the eastern end of the lake. A gage was erected July 1, 1904, on the highway bridge crossing Fish creek at Sylvan Beach. This bridge is within a short distance of the outlet of Fish creek and the gage shows practically the water-level in the eastern end of the lake. The gage is vertical and is attached to piles at the left-hand end of the bridge on the down-stream side. The gage reads from 370.00 to 379.00 feet, and is divided to tenths of feet by notches. The readings are elevations above Barge canal datum. Readings are taken at 8 A. M. by F. B. Randall.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Fish Creek at Sylvan Beach, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	371.2	371.3	370.3	372.7	372.2	371.1	370.4	370.1	369.2	369.7	370.6	.....
2	371.2	371.2	370.3	372.7	372.2	371.0	370.5	370.1	369.2	369.8	370.6	.....
3	371.2	371.2	370.3	372.6	372.1	371.0	370.5	370.1	369.3	369.8	370.9	.....
4	371.5	371.3	370.3	372.5	372.1	371.1	370.5	370.0	369.3	369.8	371.0	371.0
5	372.1	371.2	370.3	372.4	372.0	371.2	370.6	370.0	369.4	369.8	371.0	370.9
6	372.8	371.2	370.3	372.4	372.0	371.2	370.6	370.0	369.4	369.9	371.0	370.9
7	372.9	371.1	370.3	372.4	372.0	371.1	370.5	369.9	369.4	370.4	371.8	370.9
8	372.9	371.0	370.3	372.3	372.9	371.0	370.5	369.9	369.5	370.5	371.8	370.8
9	373.0	371.0	370.3	372.3	371.9	370.9	370.4	369.9	369.5	370.5	371.9	370.8
10	373.0	370.8	370.3	372.3	371.8	370.8	370.4	369.8	369.4	370.4	371.9	370.9
11	373.0	370.8	370.3	372.2	371.8	370.8	370.4	369.8	369.4	370.3	372.5	371.4
12	373.1	370.7	370.3	372.2	371.8	370.7	370.3	369.7	369.4	370.2	372.2	371.5
13	373.0	370.7	370.4	372.2	371.7	370.7	370.3	369.7	369.3	370.2	372.3	371.4
14	372.8	370.6	370.6	372.1	371.7	370.6	370.3	369.7	369.3	370.2	372.1	371.2
15	372.6	370.6	370.7	372.1	371.6	370.5	370.3	369.6	369.4	370.1	372.4	371.3
16	372.6	370.6	370.7	372.0	371.6	370.5	370.2	369.6	369.4	370.1	372.3	371.3
17	372.6	370.6	370.9	372.0	371.5	370.5	370.2	369.5	369.5	370.2	372.1	371.5
18	372.5	370.5	371.0	371.9	371.5	370.4	370.2	369.5	369.5	370.3	372.0	371.5
19	372.6	370.5	371.1	371.8	371.4	370.4	370.1	369.5	369.5	370.3	372.0	371.5
20	372.4	370.5	371.2	371.7	371.4	370.4	370.1	369.4	369.5	370.3	371.9	371.5
21	372.3	370.4	371.2	371.8	371.3	370.5	370.2	369.4	369.5	370.4	371.8	371.5
22	372.1	370.4	371.3	371.9	371.2	370.4	370.2	369.5	369.6	370.4	371.7	371.5
23	372.0	370.4	371.4	371.9	371.1	370.4	370.1	369.4	369.6	370.5	371.5	371.4
24	371.9	370.4	371.6	371.9	371.1	370.4	370.1	369.4	369.6	370.5	371.6	371.6
25	371.8	370.4	371.9	372.0	371.1	370.4	370.0	369.4	369.7	370.6	371.7	372.1
26	371.8	370.3	372.0	372.0	371.2	370.3	370.0	369.3	369.7	370.6	371.6	372.5
27	371.7	370.3	372.2	371.9	371.2	370.3	370.0	369.3	369.8	370.7	371.5	372.3
28	371.6	370.3	372.2	371.9	371.2	370.3	370.1	369.3	369.8	370.7	371.5	372.4
29	371.6	...	372.6	371.8	371.1	370.3	370.2	369.3	369.7	370.8	371.5	372.4
30	371.5	....	372.8	371.8	371.1	370.4	370.1	369.2	369.7	370.8	371.4	372.4
31	371.5	.....	372.8	.....	371.1	...	...	369.2	....	370.7	.....	372.7

ONEIDA CREEK.

DESCRIPTION.

The head waters of Oneida creek are in northeastern Madison county. Above Peterboro the drainage is mostly through a swamp averaging one-half mile in width by 2½ miles in length. The stream flows easterly from this swamp to the foot of the falls above Munnsville. In the vicinity of the falls the stream descends from elevation 1,100 to elevation 700 in about three miles. From Munnsville to Oneida the creek flows through a somewhat dissected valley of one mile average width, bordered by steep slopes rising 500 feet or more within a distance of one mile on either side. North of Oneida Castle the drainage is rather flat. Oneida creek enters the eastern end of Oneida lake near South Bay, the elevation of the lake being at 370. Water-power is utilized at Oneida Community and at Munnsville. A feeder dam at Oneida Castle diverts most of the low-water flow to the Erie canal through a feeder 2.9 miles long entering the canal at Durhamville. The drainage basin as a whole is irregularly pear-shaped and the upper basin is broad. The slopes are steep and the tributaries are well distributed and moderately branching. This basin is shown on the Morrisville, Oneida, Chittenango and Cazenovia sheets of the U. S. Geological Survey topographic map.

ONEIDA CREEK AT KENWOOD, N. Y.

A gaging station was established at the Oneida Community Dam and Silk Mill, June 11, 1907, by Robert E. Horton. A four-foot enamelled steel gage graduated to hundredths of feet is attached to a tree on the left-hand bank of Oneida creek, 175 feet up-stream from the dam. The dam is of timber, having a crest length of 79.25 feet. The crest is nearly level and the cross-section is uniform throughout the entire length. A board gage with painted 10th-foot marks was also placed in the tail-race immediately below the silk mill. The silk mill contains one 24-inch Hercules and one 24-inch Camden water-wheel. Records are kept by Carl Hatch, showing the crest and tail-race gage readings each morning and night, together with the gate opening and number of hours run per day for each water-wheel. The elevations are referred to an assumed bench-mark consisting of a chiselled cross on the up-stream corner of the right-hand abutment of the dam.

Elevation of assumed bench-mark	100.00
Elevation of crest of gage zero	94.01
Mean crest elevation about	95.60
Tail-race gage zero..............................	82.97

Current-meter measurements were made in the tail-race to determine the turbine discharge in 1907.

The results of gagings at this station, 1898 to 1900, inclusive, may be found in the report of State Engineer and Surveyor for 1902, Supplement, pages 49–52. Additional data is given in the report for 1906, Supplement, pages 138–139.

Mean Daily Discharge, Second-feet, of Oneida Creek at Kenwood, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	...	...	...	...	...	....	54.9	51.4	3.1	38.8	43.3	80.0
2	...	...	...	...	...	....	31.6	84.4	7.1	28.1	50.3	464.1
3	...	...	...	...	...	....	26.0	35.4	25.8	44.0	203.0	61.5
4	...	...	...	...	...	....	29.8	28.1	51.6	56.8	156.5	51.5
5	...	...	...	...	...	....	27.9	31.9	38.0	63.1	111.5	54.5
6	...	...	...	...	...	....	30.6	32.3	19.4	62.0	79.5	61.5
7	...	...	...	...	...	....	11.9	28.4	22.9	81.3	632.9	48.4
8	...	...	...	...	...	....	22.6	24.7	23.8	271.0	349.3	67.0
9	...	...	...	...	...	....	30.3	24.1	30.6	154.6	247.0	74.5
10	...	...	...	...	...	....	24.8	30.8	27.8	118.0	211.0	206.5
11	...	...	...	...	...	38.7	27.3	15.2	106.6	96.9	172.5	206.5
12	...	...	...	...	...	31.6	35.4	26.9	63.2	108.7	164.5	140.5
13	...	...	...	...	...	31.6	43.1	21.3	43.4	71.1	131.7	138.0
14	...	...	...	...	...	30.8	26.0	21.6	26.2	82.5	103.5	103.1
15	...	...	...	...	...	29.0	34.2	19.6	12.1	70.6	103.5	55.0
16	...	...	...	...	...	9.6	27.3	19.6	30.1	61.7	77.5	86.4
17	...	...	...	...	...	29.3	25.6	21.9	24.3	54.7	79.0	78.4
18	...	...	...	...	...	25.5	48.7	3.3	23.0	49.8	86.5	73.4
19	...	...	...	...	...	26.5	38.3	21.5	33.9	42.6	70.7	74.5
20	...	...	...	...	...	26.3	29.5	19.7	27.1	41.0	70.5	93.5
21	...	...	...	...	...	14.1	63.6	19.6	32.1	52.4	86.5	61.4
22	...	...	...	...	...	22.8	50.4	19.5	17.1	44.7	79.5	39.0
23	...	...	...	...	...	5.3	78.8	5.4	32.1	43.3	78.8	378.1
24	...	...	...	...	...	25.3	70.2	15.6	25.3	36.4	80.0	471.1
25	...	...	...	...	...	21.6	167.5	3.0	36.0	31.3	91.7	222.0
26	...	...	...	...	...	24.5	88.0	19.8	29.9	34.4	74.5	175.0
27	...	...	...	...	...	24.4	68.1	19.8	22.3	25.6	90.5	93.0
28	...	...	...	...	...	23.5	48.6	19.6	19.7	87.9	80.0	193.0
29	...	...	...	...	...	27.5	32.9	19.5	13.8	85.3	85.0	193.0
30	...	...	...	...	...	7.2	25.6	16.4	42.5	66.5	76.8	141.1
31	...	...	...	...	...	.....	29.5	17.1	......	62.3	......	157.3
Mean	...	...	...	...	.....	23.8	43.5	23.8	30.4	69.9	132.6	140.6

Monthly Discharge of Oneida Creek at Kenwood, N. Y.

[Drainage area, 63 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
June (20 days)	38.7	5.3	23.8	0.378	0.423
July	167.5	11.9	43.5	0.692	0.796
August	84.4	3.3	23.8	0.378	0.435
September	106.6	3.1	30.4	0.483	0.541
October	271.0	25.6	69.9	1.11	1.28
November	632.9	43.3	132.6	2.11	2.36
December	471.1	39.0	140.6	2.24	2.58

CHITTENANGO CREEK.

DESCRIPTION.

Chittenango creek is the principal tributary of Oneida lake from the south. It comprises three main branches: Butternut creek, Limestone creek and Chittenango creek proper. The three branches join near North Manlius. Above the junction of Butternut creek, Chittenango creek flows through an irregular dumbbell-shaped area extending in a northwest and southeast direction. This area lies chiefly in the dissected, hilly region south of the line of the New York Central railroad. The length of the basin is about 22 miles. Its width in the upper portion is 9 miles; in the middle portion, 4 miles; in the lower portion, 7 miles. The drainage basin is deeply rolling, mostly cleared and has a heavy, impervious soil with extensive sodded-meadow areas. The soil is underlaid by shale rock, often outcropping, and affording numerous springs. The stream tributaries are somewhat sparse. Marsh and swamp areas are very limited, with the exception of the Nelson swamp, about two square miles in area.

There were formerly several water-powers in use in the deep narrow valley between Chittenango falls and Chittenango. The outflow from Cazenovia lake is regulated and there is also a reservoir at Erieville. These reservoirs are used to supply the summit level of the Erie canal. The capacities of these reservoirs are given as follows in New York State Barge Canal Report for 1901, page 663:

Erieville Reservoir.

Tributary drainage area	5.4 square miles
Storage capacity	318,424 cubic feet
Water-surface	340 acres

Cazenovia Lake.

Tributary drainage area	8.7 square miles
Storage capacity	206,997 cubic feet
Water-surface	1.7 square miles

The head of the stream is near Erieville reservoir, which is formed by a dam crossing a small stream valley, formerly tributary to Chenango river through Eaton brook. Results of gagings of Chittenango creek at Bridgeport, where the stream debouches into Oneida lake, may be found in the report of the State Engineer and Surveyor for 1902, Supplement, pages 57–61. Cazenovia lake is located 10 miles below the Erieville reservoir, which is at the head of the stream at elevation 1,190. From its outlet to the foot of the plateau at Erie canal crossing the stream descends

770 feet, the distance, following the general trend of the valley, being 11 miles. At Chittenango falls there occurs a precipitous descent of about 100 feet.

CHITTENANGO CREEK AT CHITTENANGO, N. Y.

A current-meter gaging station was established at Main street highway bridge in Chittenango village, May 22, 1901, by R. E. Horton, for the U. S. Geological Survey, by which it was maintained until July 9, 1905, when it was transferred to the care of this Department. Current-meter measurements have been taken and rating table made, from which the accompanying tables have been computed.

The stream at this point is entrained between parallel walls, affording a channel 50 feet wide, over which the bridge passes at a single span. The bridge stands at an angle to the thread of the stream, and has a span between abutments of 57 feet. The gage board is secured in a vertical position to the right abutment on the up-stream side, and reads decimally from 0 to 8 feet. The stage of the stream is observed twice daily by the gage-reader, Bessie M. Kellogg. The bench-mark is on the up-stream corner of the coping of the right-hand bridge abutment.

Elevation, bench-mark	458.39
Elevation, gage zero	450.16

The gaging station is one-half mile above the State dam, diverting water for the supply of the summit level of Erie canal. The freshet of December 15, 1901, changed the cross-section of the stream at the gaging station. Separate rating curves have been prepared for the periods preceding and following that date.

Current-meter Discharge Measurements of Chittenango Creek at Chittenango, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
May 17	Weeks and Niles.............	1.90	......	124	1.48	184
Aug. 20	E. C. Niles..................	1.60	......	99.3	0.87	86.2

Rating table for Chittenango Creek at Chittenango, N. Y., for 1907.

Gage height.	Discharge.	Difference.	Gage height.	Discharge.	Difference.	Gage height.	Discharge.	Difference.	Gage height.	Discharge.	Difference.
1.00	30	5	1.90	135	20	2.80	440	45	3.70	910	60
1.00	35	5	2.00	155	25	2.90	485	45	3.80	970	65
1.20	40	10	2.10	180	30	3.00	530	50	3.90	1,035	65
1.30	50	10	2.20	210	30	3.10	580	50	4.00	1,100	70
1.40	60	10	2.30	240	35	3.20	630	50	4.10	1,170	70
1.50	70	15	2.40	275	40	3.30	680	55	4.20	1,240	70
1.60	85	15	2.50	315	40	3.40	735	55			
1.70	100	15	2.60	355	40	3.50	790	60			
1.80	115	20	2.70	395	45	3.60	850	60			

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Chittenango Creek at Chittenango, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	452.3	451.7	451.4	451.7	452.2	451.6	452.1	452.4	451.7	451.6	451.7	451.8
2	452.1	451.8	451.7	451.7	452.1	451.7	451.9	452.2	451.6	451.5	451.8	451.9
3	452.5	451.8	451.7	451.8	452.3	451.6	451.7	451.8	451.8	452.0	452.4	451.9
4	454.0	451.8	451.7	451.9	452.2	451.6	451.5	451.7	452.0	451.9	452.3	451.9
5	452.9	451.7	451.7	451.7	452.4	451.6	451.5	451.6	451.9	451.7	452.1	451.8
6	452.3	451.7	451.7	451.6	452.3	451.5	451.4	451.5	451.7	451.5	452.0	451.7
7	452.6	451.8	451.6	451.7	452.2	451.6	451.5	451.6	451.6	451.6	453.5	451.8
8	453.2	451.8	451.5	451.7	452.4	451.7	451.6	451.6	451.6	452.6	452.8	451.9
9	452.8	451.8	451.7	451.7	452.4	451.6	451.7	451.6	451.7	452.4	452.5	451.8
10	452.4	451.6	451.7	451.8	452.3	451.5	451.9	451.7	451.8	452.2	452.4	453.0
11	452.3	451.6	451.8	451.8	452.4	451.6	451.1	451.6	452.0	452.0	452.2	452 8
12	452.1	451.7	451.8	451.6	452.4	451.5	451.9	451.7	452.2	452.0	452.1	452.6
13	452.0	451.7	452.3	451.7	452.3	451.6	451.7	451.7	452.0	452.1	452.2	452.4
14	451.9	451.8	452.7	451.7	452.2	451.5	451.6	451.6	451.8	451.9	452.3	452.2
15	451.9	451.8	452.4	451.8	452.3	451.6	451.5	451.5	451.6	451.9	452.1	452.2
16	452.0	451.9	452.2	452.0	452.3	451.5	451.5	451.6	451.6	451.8	452.2	452.2
17	452.0	451.9	452.4	452.2	452.0	451.5	451.6	451.6	451.6	451.7	452.0	452.1
18	451.9	451.8	452.7	452.3	451.9	451.5	452.1	451.6	451.7	451.7	452.0	452.1
19	452.0	451.8	452.7	452.2	451.8	451.9	451.7	451.6	451.8	451.7	451.9	452.0
20	451.8	451.8	452.8	452.1	451.7	452.0	451.7	451.6	451.9	451.8	451.9	452.1
21	451.8	451.8	453.0	452.1	451.7	451.8	451.5	451.7	452.0	451.8	452.0	452.2
22	451.9	451.8	453.3	452.0	451.6	451.6	451.5	451.6	451.9	451.7	451.9	452.3
23	451.8	451.7	453.7	452.0	451.5	451.6	452.3	451.6	451.9	451.8	452.0	453.6
24	451.8	451.4	454.0	453.4	451.7	451.6	451.5	451.7	451.8	451.8	451.9	453.3
25	451.8	451.4	453.7	452.6	451.6	451.6	453.3	451.7	451.7	451.9	451.9	453.0
26	451.8	451.4	453.1	453.4	451.7	451.6	453.3	451.6	451.6	451.8	451.8	452.8
27	451.8	451.4	452.7	452.9	451.7	451.7	452.1	451.6	451.6	451.7	451.9	452 7
28	451.8	451.4	452.1	452.1	451.7	451.6	451.9	451.7	451.6	451.8	452.0	452.5
29	451.7	......	451.9	452.0	451.6	451.7	451.8	451.6	451.6	451.7	452.1	452.4
30	451.7	......	451.7	452.1	451.8	452.5	451.9	451.7	451.5	451.7	452.0	45'.5
31	451.8	......	451.7	......	451.6	......	451.8	451.7	......	451.7	......	45'.4

Mean Daily Discharge, Second-feet, of Chittenango Creek at Chittenango, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	195	78	40	78	168	65	145	225	70	60	78	85
2	145	85	70	70	145	70	108	155	60	50	92	100
3	240	85	78	92	195	60	78	92	92	125	225	108
4	970	85	78	108	168	65	55	78	125	108	180	100
5	417	70	78	78	225	60	50	60	108	78	135	85
6	195	70	70	65	195	55	45	50	78	55	125	78
7	275	85	65	70	168	65	50	60	60	65	708	92
8	530	85	55	78	210	70	60	60	60	295	375	100
9	355	85	78	78	225	60	78	65	70	225	258	92
10	225	65	78	85	180	50	108	70	92	168	210	462
11	195	65	92	92	225	60	135	60	125	125	168	375
12	145	70	85	65	225	55	108	70	168	115	145	295
13	125	70	180	70	195	60	78	70	125	135	168	225
14	108	85	315	78	168	50	60	60	92	108	180	168
15	100	85	225	92	195	60	50	55	65	108	145	155
16	115	100	155	125	195	50	50	65	60	85	155	168
17	125	100	210	168	125	50	60	60	60	78	125	145
18	108	85	335	195	100	55	145	60	70	70	115	135
19	115	85	335	168	85	100	78	65	92	78	100	115
20	92	85	375	145	78	125	70	60	100	85	100	135
21	92	85	462	145	70	92	55	70	115	85	115	155
22	108	85	580	125	60	65	50	65	100	70	100	180
23	92	70	820	125	55	60	195	65	108	92	115	762
24	92	45	1,002	655	70	60	55	78	85	92	100	580
25	92	45	790	295	60	65	605	70	70	100	100	462
26	92	45	485	630	70	65	605	60	65	85	85	375
27	92	45	315	417	78	70	145	60	65	78	100	315
28	92	40	145	135	70	65	100	70	65	85	115	258
29	78	..	108	125	65	78	92	60	60	78	135	210
30	78	..	78	145	85	258	108	70	50	70	115	240
31	92	.	70	.....	65	.....	85	70	.....	78	......	225
Mean	186	74	253	160	136	72	120	74	85	101	162	225

Monthly Discharge of Chittenango Creek, at Chittenango, N. Y.

[Drainage area, 79 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	970	55	186	2.34	2.69
February	100	40	74	0.932	0.969
March	1,002	40	253	3.19	3.67
April	655	65	160	2.02	2.26
May	225	55	136	1.71	1.97
June	258	50	72	0.907	1.02
July	605	45	120	1.51	1.74
August	225	50	74	0.932	1.07
September	168	50	85	1.07	1.20
October	295	50	101	1.27	1.46
November	708	78	162	2.04	2.28
December	580	78	225	2.84	3.27

LIMESTONE CREEK.

DESCRIPTION.

The natural source of Limestone creek is on the slope of Tinselor hills near Erieville, Madison county, N. Y. In the construction of the Chenango canal, Tioughnioga creek was diverted and

De Ruyter reservoir receives the drainage tributary to this stream above the point of diversion and also that from additional area tributary to Limestone creek, making a total area above the reservoir outlet of 18.8 square miles. The reservoir has a capacity of 504,468,000 cubic feet, and a surface area of about 1.0 square mile. The stored waters are discharged through Limestone creek during the canal navigation season. Water is diverted to a feeder by a dam below Manlius. The feeder is used as a water-power canal to supply several mills at Fayetteville, at which place there is a second diverting dam. The feeder enters Erie canal 1.2 miles below Fayetteville. Power is also developed on Limestone creek at Manlius and Edwards Falls. The head waters of Limestone creek are at elevation 1,900 feet. De Ruyter reservoir is at elevation 1,286 feet. The fall of the stream is rapid in the first three miles below the reservoir, the elevation at the lower end of this reach at Delphi being 900 feet. From Delphi to Buellville the creek follows a winding course over a flat valley bottom averaging about one-half mile in width. The descent in 8 miles between these points is 150 feet. Between Buellville and Manlius, a distance of two miles, a fall of 200 feet occurs. This is mostly concentrated at Edwards Falls. The west or Watervale branch of Limestone creek joins the main stream below Manlius. The precipitous descent of about 100 feet in a short distance occurs at this branch at stone quarry falls. The drainage basin is shown on the Syracuse, Tully, Chittenango and Cazenovia sheets of the U. S. Geological Survey topographic map.

LIMESTONE CREEK AT FAYETTEVILLE, N. Y.

This gaging station, which is located above the State dam at the head of the Erie canal feeder in Fayetteville, was established August 27, 1905, by C. A. Poole.

The gage is a vertical board, graduated in feet and tenths, and is secured to retaining wall on south side of gates at entrance to feeder, about 55 feet above crest of dam. The elevation of zero of gage is 429.53. The elevation of bench-mark on east end of north retaining wall of feeder, 42 feet east of gates, is 434.74. Observations are taken twice daily by C. B. Dunlop.

The dam is of masonry and in good condition, having been rebuilt in 1897. It is of trapezoidal shape with an approach slope of 1 on 6 and vertical down-stream face. The length of crest is 99.1 feet at an average elevation of 431.18. The discharge over the dam has been calculated by means of the weir formula, using coefficients derived from the Cornell University experiments made in 1898.

The flow in the feeder is controlled by gateways at entrance. There are four openings in the bulkhead, which are regulated by means of drop planks.

A gage was temporarily maintained in the canal feeder at Fayetteville, but the fluctuation was so slight that it has been discontinued.

Water is also diverted through the cement mill on east side of creek. Current-meter measurements were formerly made in the raceway to mill, and in the canal feeder. The freshet discharge of the stream can be determined at this site, but a separate gaging station was established at Manlius in July, 1907, to determine the low-water flow.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Limestone Creek above Dam at Fayetteville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	431.8	432.0	432.0	432.0	431.8	432.0	431.0	*a*	*a*	.....	431.4	431.5
2	432.5	432.0	432.0	432.0	431.8	432.0	431.0	*a*	*a*	.....	431.4	431.5
3	432.5	432.0	432.0	432.0	431.7	432.1	431.3	*a*	*a*	431.0	432.1	431.5
4	432.8	432.1	432.0	432.0	431.7	432.1	431.3	*a*	*a*	431.5	431.7	431.5
5	432.8	432.1	432.0	432.1	431.7	432.1	431.5	*a*	*a*	431.5	431.6	431.5
6	432.8	432.2	432.0	432.2	431.7	432.0	431.5	*a*	*a*	431.5	431.8	431.6
7	432.5	432.2	432.0	432.0	431.8	431.9	431.9	*a*	*a*	431.4	433.8	431.6
8	432.5	432.1	432.0	432.0	431.8	431.9	431.9	*a*	*a*	432.1	433.5	431.6
9	432.3	432.0	432.0	432.0	431.8	431.9	432.0	*a*	*a*	431.8	432.4	431.5
10	432.3	432.0	432.0	432.0	431.8	431.9	432.0	*a*	*a*	431.5	431.8	432.0
11	432.3	432.0	432.0	432.0	431.8	431.9	432.0	*a*	*a*	431.6	431.7	432.0
12	432.3	432.0	432.0	432.0	431.8	431.9	432.0	*a*	*a*	431.7	431.7	431.7
13	432.3	432.0	432.1	432.0	431.9	432.0	432.0	*a*	*a*	431.5	431.7	431.6
14	432.1	432.0	432.2	432.0	431.9	432.0	432.0	*a*	*a*	431.5	431.7	431.7
15	432.1	432.0	432.2	432.1	431.9	432.0	432.3	*a*	*a*	431.5	431.6	431.7
16	432.1	432.0	432.5	432.1	431.9	431.9	432.3	*a*	*a*	431.4	431.7	431.7
17	432.0	432.0	432.5	432.1	431.9	431.8	432.3	*a*	*a*	431.4	431.7	431.7
18	432.0	432.0	432.5	432.2	431.9	431.5	432.1	*a*	*a*	431.5	431.6	431.7
19	432.0	432.0	432.5	432.2	431.8	431.5	432.1	*a*	*a*	431.5	431.5	431.6
20	432.0	432.0	432.3	432.2	431.8	431.3	432.1	*a*	*a*	431.4	431.5	431.6
21	432.0	432.0	432.3	432.2	431.8	431.3	432.1	*a*	*a*	431.3	431.5	431.6
22	432.0	432.0	432.3	432.0	431.9	431.3	432.1	*a*	*a*	431.3	431.4	431.6
23	432.0	432.0	432.3	432.0	431.9	431.3	432.1	*a*	*a*	431.4	431.4	432.2
24	432.0	432.0	432.3	431.5	431.9	431.3	432.1	*a*	*a*	431.3	431.4	432.3
25	432.0	432.0	432.3	431.5	431.9	431.2	432.1	*a*	*a*	431.5	431.4	432.9
26	432.0	432.0	432.3	431.5	431.8	431.2	432.0	*a*	*a*	431.3	431.4	432.9
27	432.0	432.0	432.2	431.5	431.9	431.2	432.0	*a*	*a*	431.4	431.5	433.0
28	432.0	432.0	432.2	431.5	431.8	431.2	432.0	*a*	*a*	431.6	431.5	433.1
29	432.0	...	432.2	431.5	431.8	431.2	432.0	*a*	*a*	431.7	431.6	433.1
30	432.0	...	432.2	431.5	431.8	432.0	432.3	*a*	*a*	431.5	431.5	432.9
31	432.0	...	432.2	.....	431.8	...	432.3	*a*	*a*	431.5	.....	432.9

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Limestone Creek Feeder at Fayetteville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	*a*	*a*	*a*	*a*	429.3	429.3	428.9	*a*	*a*	......	429.3	429.4
2	*a*	*a*	*a*	*a*	429.3	429.3	428.9	*a*	*a*	......	429.3	429.3
3	*a*	*a*	*a*	*a*	429.3	429.3	428.9	*a*	*a*	429.4	429.1	429.3
4	*a*	*a*	*a*	*a*	429.3	429.3	428.9	*a*	*a*	429.2	429.1	429.3
5	*a*	*a*	*a*	*a*	429.4	429.3	428.1	*a*	*a*	429.0	429.2	429.3
6	*a*	*a*	*a*	*a*	429.4	429.2	428.1	*a*	*a*	429.1	429.4	429.3
7	*a*	*a*	*a*	*a*	429.4	429.2	428.1	*a*	*a*	429.3	429.6	429.3
8	*a*	*a*	*a*	*a*	429.2	429.2	428.1	*a*	*a*	429.2	429.6	429.3
9	*a*	*a*	*a*	*a*	429.2	429.2	428.3	*a*	*a*	429.2	429.6	429.3
10	*a*	*a*	*a*	*a*	429.3	429.2	428.3	*a*	*a*	429.4	429.5	429.4
11	*a*	*a*	*a*	*a*	429.3	429.3	428.4	*a*	*a*	429.2	429.2	429.0
12	*a*	*a*	*a*	*a*	429.3	429.3	428.4	*a*	*a*	429.0	429.1	*a*
13	*a*	*a*	*a*	*a*	429.4	429.3	428.5	*a*	*a*	429.3	429.2	*a*
14	*a*	*a*	*a*	*a*	429.4	429.3	428.5	*a*	*a*	429.2	429.1	*a*
15	*a*	*a*	*a*	*a*	429.3	429.3	428.5	*a*	*a*	429.4	429.2	*a*
16	*a*	*a*	*a*	*a*	429.3	429.2	428.5	*a*	*a*	429.4	429.4	*a*
17	*a*	*a*	*a*	*a*	429.4	429.2	428.5	*a*	*a*	429.4	429.3	*a*
18	*a*	*a*	*a*	*a*	429.3	429.2	428.4	*a*	*a*	429.3	429.3	*a*
19	*a*	*a*	*a*	*a*	429.2	429.2	428.4	*a*	*a*	429.3	429.4	*a*
20	*a*	*a*	*a*	*a*	429.2	429.2	428.4	*a*	*a*	429.3	429.4	*a*
21	*a*	*a*	*a*	*a*	429.4	429.2	428.4	*a*	*a*	429.3	429.5	*a*
22	*a*	*a*	*a*	*a*	429.4	429.1	428.4	*a*	*a*	429.3	429.3	*a*
23	*a*	*a*	*a*	*a*	429.3	429.1	428.4	*a*	*a*	429.3	429.4	*a*
24	*a*	*a*	*a*	427 9	429.2	429.1	428.4	*a*	*a*	429.3	429.4	*a*
25	*a*	*a*	*a*	428.3	429.3	429 2	428 4	*a*	*a*	429.3	429.3	*a*
26	*a*	*a*	*a*	428 8	429.2	429.2	428.4	*a*	*a*	429.3	429.3	*a*
27	*a*	*a*	*a*	428.9	429.4	429.2	428.4	*a*	*a*	429.3	429.4	*a*
28	*a*	*a*	*a*	428.9	429.3	429.2	428 4	*a*	*a*	429.4	429.4	*a*
29	*a*	*a*	*a*	429.1	429.3	429.2	428 4	*a*	*a*	429.4	429.4	*a*
30	*a*	*a*	*a*	429.2	429.3	429.2	428.5	*a*	*a*	429.3	429.4	*a*
31	*a*	*a*	*a*	......	429.3	......	428.5	*a*	......	429.3	......	*a*

a No record.

Limestone Creek at Manlius, N. Y.

A gaging station was established July 23, 1907, by Robert E. Horton, for this Department, at Wilcox avenue bridge in Manlius. The gage consists of a triangular box containing a scale graduated to tenths from zero to 7.4, and a chain and weight by which the readings are taken. The gage is attached to the bottom chord on the down-stream side of the bridge. The length of the chain and weight is 14.00 feet. Readings are taken by Julius Albeck at 7 A. M. and 6 P. M. each day. Current-meter measurements are made from the down-stream side of the bridge, starting at the face of the left-hand abutment as an initial point. The bridge is subdivided into 2.5-foot sections for purposes of measurement. The span is 73 feet.

Current-meter Discharge Measurements of Limestone Creek at Manlius, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
May 22	Horton and Weeks	2.42	......	35.4	2.12	75.1
July 24	Weeks and Quinn	2.65	......	35.1	2.09	73.3
Aug. 14	E. F. Weeks	2.40	......	30.6	1.30	39.9
Aug. 17	E. C. Niles	2.42	......	31.3	1.30	40.8
Aug. 20	E. C. Niles	2.40	......	30.7	1.24	38.1
Sept. 18	E. C. Niles	2.60	......	34.4	1.79	61.6

BUTTERNUT CREEK.

DESCRIPTION.

The head waters of Butternut creek lie at elevation 1,700 feet, near the south line of Onondaga county. This stream drains a narrow basin about 24 miles in length and having an average width of about 3 miles. The stream flows in a southerly direction. Jamesville reservoir is located 14 miles below the source at elevation about 640. North of Erie canal the stream flows out into the flat lands, at elevation about 400, which border Oneida lake for a width of several miles. Butternut creek is joined by Limestone creek near North Manlius at a point about 1½ miles above its junction with Chittenango creek. Erie canal crosses the stream 4½ miles below Jamesville. Above Erie canal crossing the slopes are steep and the tributaries are mostly short laterals. Jamesville reservoir has a capacity of 170,000,000 cubic feet. The water-surface area is 252 acres. At a distance of 2.35 miles below Jamesville is a dam which diverts part of the stream to the Orrville feeder. This feeder is 2.25 miles in length.

BUTTERNUT CREEK NEAR JAMESVILLE, N. Y.

A gaging station was established on Butternut creek at the first bridge above the head of the Orrville feeder, July 25, 1907, by Robert E. Horton, for this Department. The gage is located about 2 miles below Jamesville, and measurements at this point will show the supply to the canal available from Jamesville reservoir and the Orrville feeder. A box-and-chain gage is bolted to the hand-rail of the bridge on the up-stream side. The gage scale reads from zero to 7.5 feet, and the length of the chain is 13.00. The current-meter measurements are made from the down-stream side of the bridge, using the face of the right-hand abutment as an initial point. The bridge is subdivided at two-foot intervals and the span is 40 feet. The gage is read at 7 A. M. and 6 P. M. by Marie Brandt.

Current-meter Discharge Measurements of Butternut Creek near Jamesville, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
May 22	Horton and Weeks	*7.55	......	31	1.81	56
July 25	Weeks and Quinn	3.48	......	112	3.62	406
July 25	Weeks and Quinn	3.00	......	89	3.14	283
July 26	Weeks and Quinn	2.45	......	71	2.51	178
July 26	Weeks and Quinn	2.45	......	71	2.66	189
Aug. 14	E. F. Weeks	1.78	......	45	1.47	66
Aug. 16	E. C. Niles	1.78	......	45	1.64	74
Aug. 20	E. C. Niles	1.40	......	31	1.03	32
Sept. 18	E. C. Niles	1.65	......	40	1.18	47

* Reference point.

GAGES ON SENECA RIVER.

Seneca river receives the drainage from the central group of lakes lying southward from Lake Ontario. The drainage basin is rolling, though not precipitous, excepting for the deep, narrow valleys crossing it, in which the lakes are situated, and certain additional valleys not at the present time occupied by lakes.

Gages have been maintained on Seneca river and its main tributaries during 1907 at the places named in the following table:

STREAM.	Location.	DISTANCE IN MILES FROM—		Present type of gage.
		Three River Point.	Station to station.	
Seneca river.....	Three River Point *a*	0	0	Board with coppered staples.
Seneca river.....	Gascon reef........................	.9	.9	Board with coppered staples.
Seneca river.....	Belgium (new bridge)........................	1.9	1.0	Chain and plumb-bob.
Seneca river.....	Mud lock (foot of Onondaga outlet)........................	7.0	5.1	Board with coppered staples.
Onondaga outlet	Foot of lake, Long Branch........................	7.9	.9	Board with coppered staples.
Onondaga lake.	Near Iron pier—head of lake—Syracuse	12.5	4.6	Reference point.
Seneca river...	Below dam, Baldwinsville........................	12.4	5.4*b*	Chain and plumb-bob.
Seneca river .	Above dam, Baldwinsville........................	12.5	0.1	Galvanized staple gage.
Seneca river .	Below Jack's reef, Eel weir	20.8	8.3	Board with coppered staples.
Seneca river. .	Above Jack's reef, State ditch...	23.2	2.4	Board with coppered staples.
Seneca river...	Bonta's bridge, 1 mile west of Cross lake...........	26.4	3.2	Board with coppered staples.
Seneca river....	Mosquito Point bridge........................	35.6	9.2	Board with coppered staples.
Seneca river....	N.Y. C. & H. R. R. bridge, 1½ miles west of Fox Ridge	40.8	5.2	Chain and plumb-bob.
Seneca river. ...	West Mud lock, foot of Cayuga lake...............	49.0	8.2	Board with coppered staples.
Clyde river......	Clyde........................	56.4*c*	15.6*c*	Chain and plumb-bob.
Clyde river......	Lyons........................	67.6	11.2	Chain and plumb-bob.
Ganargua creek.	2 miles west of Newark........................	76.3	8.7	Chain and plumb-bob.
Ganargua creek.	2½ miles east of Palmyra (Harrison mill)...........	81.0	4.7	Board gage.

a Gage on Oneida river highway bridge.
b Continuing on Seneca river.
c Leaving Seneca river at mouth of Clyde river near Montezuma 45.8 miles from Three River Point.

SENECA RIVER AT HEAD OF GASCON REEF.

A gage was established at the head of Gascon reef, about 3 miles south of Phœnix, N. Y., April 16, 1904, by this Department. The gage is vertical and consists of a board graduated from zero to 8 feet, attached to the down-stream end of the right-hand face of the wall of a culvert under the towing-path on the right-hand bank of Seneca river about midlength of the breakwater at Gascon reef. The zero of the gage is at elevation 360.44, and readings are taken each morning by Solomon Walts.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at head of Gascon Reef.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	364.02	363.62	362.52	364.52	363.82	362.52	362.32	361.82	......	361.42	362.52	......
2	364.22	363.52	362.32	364.52	363.82	......	362.32	361.82	361.12	361.02	362.62	362.62
3	364.32	......	......	364.32	363.52	362.42	362.32	361.62	360.72	361.02	......	362.42
4	365.02	364.02	362.32	364.32	363.52	362.32	362.42	......	360.32	361.22	362.82	362.52
5	365.42	363.92	362.42	364.12	......	362.22	362.52	361.62	360.82	361.12	362.82	362.52
6	......	363.72	362.52	363.92	363.52	362.42	362.32	361.62	360.82	......	362.92	362.42
7	365.62	363.82	362.32	......	363.42	362.52	......	361.62	361.02	361.52	363.12	362.42
8	365.92	363.62	362.02	363.82	363.52	362.52	362.32	361.42	......	361.52	363.32	......
9	365.82	363.42	361.92	363.72	363.62	......	362.22	361.42	361.22	361.62	363.52	362.52
10	365 82	......	......	363.62	363.42	362.42	362.12	361.82	361.22	361.62	......	362.72
11	365.82	363.12	361.92	363.42	363.42	362.32	362.02	......	361.42	361.82	363.82	362.62
12	365.72	363.12	361.92	363.22	......	362.32	362.02	361.92	361.52	361.92	363.82	362.62
13	......	363.22	361.92	363.22	363.22	362.22	361.82	361.82	361.52	......	363.72	362.62
14	365.82	363.32	362.12	......	363.22	362.22	......	361.72	361.42	362.22	363.52	362.92
15	365.52	363.22	362.32	363.32	363.12	362.02	362.02	361.42	......	361 82	363.42	......
16	365.32	362.92	362.92	363.22	363.22	......	361.82	361.22	361.22	361.72	363.42	362.62
17	365.22	......	......	363.12	363.12	362.02	361.82	361.22	360.42	361.72	.....	362.42
18	365.12	362.72	363.32	363.02	363.12	361.82	361.82	......	361.22	361.62	363.22	362.52
19	364.92	362.92	363.52	362.92	......	361.72	361.72	361.42	361.12	361.82	363.02	362.52
20	......	362.72	363.62	362.92	363.02	361.72	361.72	361.12	361.22	.....	362.92	362.42
21	364.82	362.42	363.62	......	362.92	361.52	......	360.82	360.72	362.02	362.82	362.42
22	364.82	363.12	363.62	362.82	362.82	361.52	361.92	360.72	......	362.22	362.82	......
23	364.52	362.62	364.02	362.72	362.72	......	361.92	360.62	361.12	362.22	362.82	362.82
24	364.32	......	......	362.92	362.62	362.32	361.82	360.52	361.22	362.32	......	363.22
25	364.12	362.32	364.32	363.12	362.62	362.22	362.02	......	360.42	362.02	362.82	363.92
26	363.92	362.52	364.52	363.32	......	362.12	362.02	360.82	361.12	362.02	362.62	364.52
27	......	362.52	364.62	363.65	362.52	362.12	362.02	360.72	360.32	......	362.62	364.92
28	363.92	362.62	364.62	......	362.62	362.02	......	360.52	360.32	362.12	362.62	365.02
29	363.72	......	364.62	363.72	362.52	362.02	362.12	360.32	......	362.12	362.82	......
30	363.62	......	364.52	363.72	362.52	......	361.82	360.32	361.52	362.32	362.62	365.02
31	363.62	......	......	......	362.42	......	361.82	360.32	......	362.42	.....	365.12

Seneca River at Belgium, or new, Bridge, N. Y.

A box-and-chain gage was established on the down-stream end of the right-hand pier of the bridge across Seneca river at Belgium, April 14, 1904, by this Department. The gage scale reads decimally from zero to 9 feet. The standard chain length is 20 feet and the gage datum 358.27. Readings are taken each morning by Solomon Walts.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at Belgium Bridge.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	364.0	363.7	362.5	364.7	364.2	362.8	362.3	361.9	360.5	361.2	362.2	363.1
2	364.3	363.6	362.2	364.7	364.2	362.7	362.3	361.7	361.0	360.9	362.3	363.0
3	364.5	363.8	362.3	364.5	364.0	362.7	362.3	361.7	360.9	361.0	362.5	362.9
4	365.3	364.1	362.3	364.5	364.0	362.5	362.4	361.5	360.5	361.2	362.6	362.8
5	365.6	364.2	362.4	364.3	364.0	362.4	362.5	361.5	361.0	361.1	362.6	362.7
6	365.9	364.0	362.5	364.0	364.0	362.5	362.3	361.5	361.0	361.3	362.7	362.5
7	365.7	363.9	362.2	364.0	363.9	362.6	362.2	361.4	361.1	361.6	362.9	362.5
8	366.0	363.7	362.1	364.0	363.9	362.6	362.3	361.4	361.0	361.6	363.5	362.5
9	365.9	363.5	362.0	363.9	363.8	362.6	362.2	361.4	361.2	361.6	363.7	362.6
10	366.0	363.5	362.0	363.8	363.7	362.6	362.0	361.8	361.3	361.7	363.9	362.7
11	366.0	363.3	361.9	363.6	363.7	362.5	362.0	361.7	361.2	361.8	364.0	362.6
12	365.9	363.3	361.9	363.5	363.7	362.3	362.0	361.6	361.3	361.9	364.0	362.6
13	365.8	363.4	361.9	363.5	363.7	362.2	361.9	361.5	361.2	362.2	363.9	362.6
14	365.6	363.5	362.3	363.6	363.5	362.2	362.1	361.5	361.2	362.6	363.7	363.0
15	365.7	363.4	362.6	363.6	363.4	362.1	362.2	361.3	361.3	362.0	363.6	362.9
16	365.5	362.8	363.0	363.5	363.5	362.0	361.9	361.0	361.4	361.9	363.6	362.9
17	365.3	362.8	363.7	363.4	363.4	362.1	361.9	361.0	361.4	361.9	363.4	362.6
18	365.2	362.8	364.0	363.3	363.4	361.9	361.9	361.2	361.3	361.8	363.4	362.7
19	364.9	363.2	364.1	363.2	363.3	361.8	361.8	361.1	361.2	361.8	363.2	362.7
20	365.2	362.8	364.2	363.2	363.3	361.7	361.8	361.0	361.3	361.8	363.1	362.6
21	365.0	362.6	364.2	363.1	363.2	361.5	361.7	360.8	361.2	362.0	363.0	362.6
22	365.0	362.8	364.2	363.0	363.1	361.5	361.9	360.7	361.2	361.7	363.0	362.8
23	364.7	362.7	364.5	362.9	363.0	362.2	361.9	360.7	361.4	361.7	363.0	363.2
24	364.3	362.4	364.6	363.1	362.9	362.3	361.8	360.6	361.4	361.8	362.9	363.8
25	364.2	362.4	364.6	363.3	362.9	362.2	362.0	361.0	361.2	361.7	363.0	364.2
26	364.0	362.8	364.7	363.6	363.0	362.1	362.2	361.2	361.3	361.7	362.8	364.6
27	364.0	362.5	364.8	363.9	363.0	362.1	362.2	361.0	360.6	361.7	362.8	364.8
28	363.9	362.6	365.0	364.1	363.0	362.0	362.1	360.8	360.7	361.8	362.8	364.9
29	364.0	......	365.0	364.1	362.9	362.0	362.2	360.5	361.1	362.0	363.0	364.9
30	363.8	......	364.9	364.1	362.9	362.1	361.9	360.5	361.4	362.2	362.9	365.2
31	363.7	......	364.8	......	362.8	......	361.9	360.5	......	362.2	......	365.2

SENECA RIVER AT MUD LOCK NEAR LONG BRANCH, N. Y.

A gage was established at the junction of Oswego canal with Seneca river, April 16, 1904, by this Department. This gage also shows approximately the water-level at the junction of Seneca river and Onondaga outlet. The gage is vertical and reads from zero to 9 feet and is subdivided to tenths of feet by coppered staples. The gage zero is at elevation 360.56. Readings are taken daily by Frank Shane.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at Mud Lock near Long Branch, N Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	364.16	364.26	362.86	365.26	364.66	363.16	362.56	362.16	361.26	361.56	......	363.46
2	364.76	364.16	362.86	365.16	364.56	363.06	362.66	362.06	361.26	361.46	......	363.36
3	365.16	364.36	362.76	365.06	364.46	363.06	362.66	361.96	361.06	361.36	362.66	363.36
4	365.86	364.56	362.76	364.96	364.46	362.96	362.66	361.86	360.76	361.36	362.86	363.26
5	366.36	364.56	362.76	364.86	364.46	362.86	362.66	361.86	360.86	361.26	363.16	363.06
6	366.46	364.46	362.66	365.16	364.56	362.96	362.66	361.96	361.06	361.36	363.26	362.96
7	366.56	364.36	362.66	364.56	364.46	362.96	362.66	361.96	361.36	361.46	363.36	362.86
8	366.66	364.26	362.56	364.46	364.46	362.86	362.66	362.06	361.36	361.46	363.86	362.86
9	366.76	364.06	362.56	364.36	364.56	362.86	362.56	361.96	361.36	361.36	364.06	362.96
10	366.76	363.86	362.56	364.26	364.46	362.86	362.46	361.96	361.36	361.46	364.26	362.96
11	366.66	363.76	362.46	364.16	364.86	362.76	362.46	361.96	361.36	361.56	364.46	363.06
12	365.56	363.66	362.46	364.16	364.16	362.66	362.36	361.86	361.46	361.66	364.46	363.16
13	365.46	363.66	362.46	364.16	364.06	362.46	362.36	361.86	361.46	361.56	364.36	363.06
14	366.36	363.56	363.46	364.06	363.96	362.46	362.36	361.76	361.46	361.56	364.26	363.16
15	366.36	363.56	363.16	363.96	363.86	362.36	......	361.76	361.46	361.56	364.26	363.16
16	366.36	363.36	363.56	363.86	363.86	362.26	362.36	361.46	361.56	361.76	364.16	363.06
17	366.16	363.26	364.06	363.76	363.76	362.16	362.36	361.26	361.56	361.86	363.86	363.06
18	365.76	363.26	364.36	363.66	363.76	362.16	362.36	361.26	361.36	361.86	363.66	363.26
19	365.56	363.16	364.66	363.56	363.76	362.06	362.36	361.16	361.36	361.86	363.56	363.26
20	365.66	363.16	364.76	363.46	363.66	362.06	362.26	361.06	361.46	362.06	363.46	363.06
21	365.66	363.16	364.86	363.36	363.56	361.96	362.36	361.06	361.36	362.46	363.46	363.06
22	365.56	363.06	364.86	363.36	363.46	362.06	362.36	360.96	361.36	362.46	363.36	363.06
23	365.26	363.06	365.06	363.26	363.46	362.16	362.36	361.16	361.36	362.26	363.26	363.36
24	364.86	363.06	365.16	363.56	363.36	362.26	362.36	361.26	361.36	362.26	363.16	364.36
25	364.66	362.96	365.36	363.76	363.16	362.36	362.36	361.36	361.26	362.36	363.16	364.96
26	364.56	362.86	365.36	364.06	363.36	362.36	362.36	361.46	361.16	362.36	363.06	365.26
27	364.46	362.86	365.36	364.46	363.56	362.26	362.46	361.46	360.96	362.26	363.06	365.36
28	364.36	362.96	365.46	364.56	363.46	362.26	362.56	361.46	361.16	362.76	363.16	365.46
29	364.26	......	365.36	364.66	363.36	362.36	362.56	361.36	361.46	362.86	363.26	365.56
30	364.26	......	365.36	364.66	363.26	362.46	362.56	361.26	361.66	362.86	363.36	365.76
31	364.16	......	365.36	......	363.16	......	362.46	361.26	......	......	......	365.86

ONONDAGA CREEK.

DESCRIPTION.

Onondaga lake receives the drainage from two principal tributaries, Onondaga creek and Otisco lake outlet, or Nine Mile creek. The lake is drained by a short outlet about one mile in length, entering Seneca river at Mud Lock. The outlet was formerly improved by the State for the purpose of draining lands adjoining the lake and reducing the flood level. The accompanying table shows the maximum recorded stages in the lake at various times. The fall from the foot of the lake to Seneca river is very slight. The stage is affected by a growth of aquatic plants so that the discharge from the outlet is apparently not a direct function of the stage. The stage of the lake is also affected by the stage of Seneca river. It is stated that flows in Onondaga lake usually recede before the maximum stage of Seneca river, so that at times the current in the outlet is reversed and water flows from the river into the lake. A detailed description of the drainage basin, with results of current-meter measurements made in the outlet, may be found in the report of the State Engineer and Surveyor for 1904, pages 494–501.

ONONDAGA OUTLET NEAR LONG BRANCH, N. Y.

A gage was established by this Department, April 16, 1904, in the head of Onondaga outlet. The present gage is a vertical board scale reading from zero to 9 feet, divided into tenths of feet by coppered staples. It is attached to a branching willow tree on the right bank of the outlet about 300 feet above the highway bridge, leading to Long Branch station of the Syracuse & Baldwinsville Electric railroad. Readings are taken each morning by Joseph Kennedy. The gage zero was at elevation 360.97, preceding March 27, 1907, and at elevation 361.07, beginning March 27, 1907.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Onondaga Outlet near Long Branch, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	364.9	364.5	363.1	365.5	364.8	363.4	363.1	363.3	362.0	362.2	363.2	363.8
2	365.0	364.5	363.1	365.4	364.8	363.3	363.2	363.3	362.0	362.2	363.2	363.8
3	365.2	364.6	363.1	365.3	364.7	363.2	363.3	363.2	362.1	362.3	363.3	363.7
4	366.1	364.7	363.1	365.1	364.7	363.1	363.3	363.1	362.2	362.3	363.4	363.7
5	366.8	364.7	363.0	365.0	364.7	363.1	363.2	363.0	362.3	362.3	363.4	363.6
6	366.8	364.7	363.0	364.8	364.6	363.1	363.2	363.0	362.3	362.3	363.6	363.5
7	366.8	364.6	362.9	364.7	364.6	363.2	363.1	363.0	362.3	362.4	363.9	363.4
8	367.0	364.4	362.9	364.6	364.5	363.3	363.1	363.0	362.3	362.5	364.3	363.3
9	367.0	364.3	362.9	364.5	364.5	363.2	363.1	362.9	362.3	362.7	364.8	363.3
10	367.0	364.2	362.8	364.4	364.4	363.2	363.0	362.9	362.4	362.7	364.9	363.4
11	366.9	364.1	362.7	364.3	364.4	363.1	363.0	362.8	362.4	362.8	364.9	363.4
12	366.8	364.0	362.7	364.3	364.3	363.0	363.0	362.8	362.3	362.8	364.8	363.5
13	366.7	363.9	362.9	364.2	364.3	363.0	363.0	362.7	362.3	362.9	364.7	363.6
14	366.6	363.9	363.1	364.2	364.2	362.9	363.0	362.7	362.3	362.9	364.7	363.7
15	366.6	363.8	363.4	364.1	364.2	362.8	363.0	362.6	362.3	363.0	364.6	363.7
16	366.5	363.7	363.8	364.0	364.1	362.7	363.0	362.6	362.3	363.0	364.5	363.7
17	366.3	363.6	364.2	363.9	364.1	362.7	363.0	362.5	362.3	363.0	364.4	363.6
18	366.0	363.5	364.6	363.8	364.0	362.6	363.0	362.5	362.3	362.9	364.3	363.6
19	365.8	363.6	364.9	363.7	364.0	362.5	363.0	362.5	362.3	362.9	364.1	363.6
20	366.0	363.5	365.0	363.6	364.0	362.5	363.0	362.4	362.3	362.8	364.1	363.5
21	366.0	363.5	365.0	363.6	364.0	362.4	363.0	362.4	362.3	362.8	364.0	363.5
22	365.8	363.4	365.0	363.5	363.9	362.4	363.0	362.3	362.3	362.8	363.9	363.5
23	365.6	363.3	365.2	363.5	363.8	362.5	363.0	362.2	362.3	362.7	363.8	363.9
24	365.4	363.2	365.3	363.7	363.7	362.6	363.0	362.1	362.3	362.7	363.7	364.5
25	365.1	363.2	*a*	364.0	363.7	362.7	363.2	362.1	362.3	362.6	363.6	364.9
26	365.0	363.2	*a*	364.2	363.8	362.7	363.7	362.2	362.2	362.6	363.6	365.1
27	364.8	363.2	365.5	364.5	363.8	362.7	363.6	362.2	362.2	362.7	363.7	365.3
28	364.7	363.1	365.6	364.7	363.7	362.7	363.5	362.1	362.2	362.9	363.7	365.7
29	364.8	.....	365.7	364.8	363.7	362.7	363.4	362.1	362.2	363.0	363.8	365.9
30	364.7	.....	365.6	364.8	363.6	362.8	363.3	362.0	362.2	363.1	363.8	365.9
31	364.6	.....	365.6	.....	363.5	.....	363.3	362.0	.....	363.2	.....	365.9

a Gage gone.

ONONDAGA LAKE AT SYRACUSE, N. Y.

A record of the water-level of Onondaga lake at the entrance of Onondaga creek in Syracuse has been kept by this Department, beginning May 14, 1904. A chain-and-box gage was formerly maintained on the abutment of the New York Central bridge crossing Onondaga creek. A bench-mark on the angle of the down-stream side of the left-hand abutment of this bridge, consisting of a bolt head in the bridge-seat is at elevation 369.55. During 1907 the readings have been taken by measuring downward from a reference point.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Onondaga Lake at Syracuse, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	364.8	364.6	363.1	365.6	364.8	363.4	363.4	363.6	362.4	362.6	363.4	375.0
2	365.1	364.6	363.2	365.4	364.8	363.4	363.6	364.4	362.4	362.6	363.4	375.0
3	365.3	364.6	363.2	365.4	364.8	363.4	363.6	363.6	362.6	362.6	363.6	375.1
4	366.0	364.8	363.2	365.2	364.6	363.2	363.6	363.4	362.8	362.6	363.6	375.2
5	366.8	364.8	363.0	365.0	364.6	363 2	363.6	363.3	362.6	362.6	363.6	375.3
6	366.9	364.8	363.0	364.9	364.6	363.2	363.4	363.2	362.6	362.6	363.7	375.4
7	366.9	364.7	363.0	364.8	364.6	363.4	363.4	363.2	362.6	362.8	364.2	375.4
8	367.0	364.6	363.0	364.6	364.6	363.4	363.3	363.2	362.6	362.8	364.8	375.5
9	367.0	364.5	362.9	364.6	364.6	363.2	363.4	363.2	362.6	363.0	365.0	375.6
10	367.1	364.4	362.8	364.4	364.4	363.2	363.4	363.2	362.6	363.2	365.1	375.5
11	367.1	364.4	362.8	364.4	364.4	363.2	363.2	363.2	362.6	363.2	365.1	375.2
12	366.8	364.3	362.8	364.3	364.4	363.2	363.4	363.2	362.6	363.2	365.1	375.2
13	366.8	364.2	362.8	364.3	364.4	363.0	363.4	363.2	362.6	363.2	365.0	375.1
14	366.7	364.0	363.2	364.2	364.2	363.0	363.2	363.1	362.6	363.2	365.0	375.0
15	366.7	364.0	363.6	364.2	364.2	363.0	363.2	363.0	362.6	363.2	364.8	375.0
16	366.6	363.8	363.8	364.1	364.2	362.9	363.2	363.0	362.6	363.2	364.7	375.2
17	366.4	363.7	364.2	364.0	364.2	362.8	363.2	363.0	362.6	363.2	364.6	375.3
18	366.1	363.6	364.6	364.0	364.0	362.8	363.2	362.9	362.6	363.2	364.6	375.4
19	366.0	363.6	364.8	363.8	364.1	362.8	363.2	362.8	362.6	363.1	364.4	375.4
20	366.0	363.6	365.0	363.8	364.0	362.8	363.2	362.8	362.6	363.1	364.3	375.4
21	366.0	363.5	365.0	363.6	364.0	362.8	363.2	362.8	362.7	363.2	364.2	375.4
22	366.0	363.5	365.0	363.6	363.9	362.8	363.2	362.6	362.6	363.0	364.2	375.4
23	365.8	363.4	365.2	363.4	363.8	362.8	363.3	362.6	362.6	363.0	364.0	375.2
24	365.4	363.4	365.3	363.8	363.6	362.8	363.4	362.6	362.6	363.0	364.0	374.4
25	365.2	363.4	365.6	364.0	363.6	362.8	363.8	362.6	362.6	363.0	364.0	373.6
26	365.0	363.4	365.6	364.4	363.6	363.0	364.0	362.4	362.6	362.9	363.8	373.4
27	365.0	363.2	365.6	364.8	363.8	363.0	364.0	362.4	362.5	362.9	363.9	373.4
28	364.9	363.2	365.6	364.8	363.8	363.0	364.0	362.4	362.5	363.2	363.9	373.2
29	364.8	......	365.6	364.8	363.8	362.9	363.8	362.4	362.6	363.4	364.0	373.0
30	364.8	......	365.6	364.8	363.6	363.0	363.8	362.4	362.6	363.6	364.0	373.0
31	364.7	......	365.6	......	363.6	......	363.8	362.4	......	363.6	......	373.0

ONONDAGA CREEK AT SYRACUSE, N. Y.

A gaging station was established on Onondaga creek at Temple street bridge, Syracuse, by Guy Moulton, for this Department, January 16, 1908. The elevation of water-surface when the gage reads zero is 376.11. Observations are taken each morning and night by L. Moulton. Current-meter measurements are made from the bridge by the Syracuse Intercepting Sewer Commission.

Current-meter Discharge Measurements of Onondaga Creek, at Temple St. Bridge, Syracuse, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
	City of Syracuse	[a]19 78	......	......	......	812
	City of Syracuse	[a]18.10	......	......	......	474
	City of Syracuse	[a]17.82	......	......	......	396
	City of Syracuse	[a]17.48	......	......	......	314
	City of Syracuse	[a]17.37	......	......	......	311
	City of Syracuse	[a]16.80	......	......	......	221
	City of Syracuse	[a]16.43	......	......	......	173
	City of Syrausec	[a]15.92	......	......	......	112

[a] Gage height refers to Syracuse city datum, the zero of gage being 13.00.

SENECA RIVER AT BALDWINSVILLE, N. Y.

This station was established November 12, 1898.* It is maintained by U. S. Geological Survey in coöperation with this Department. The gaging station is located at the State dam in Baldwinsville, 12.5 miles along river from the junction of Seneca river with Oneida river. These two streams unite at Three River Point to form Oswego river.

The location of the gaging station is shown on the Baldwinsville sheet, United States Geological Survey topographic map.

The discharge over the main dam is calculated by the formula for a broad, flat-crested weir when flash-boards are removed. Discharge over flash-boards is calculated by the Francis formula. Gage readings in the river channel below the dam are utilized to determine the average working head on turbines. Discharge through the three main canals is determined from records of the run of water-wheels, kept in each mill, and from the recorded lockage and opening of paddles at the Oswego canal lock at the foot of the canal.

Current-meter measurements, to determine the leakage of the several mills, have been made during 1907, as in preceding years.

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* By Geo. W. Rafter, for the U. S. Deep Waterways Commission.

SENECA RIVER BELOW BALDWINSVILLE DAM.

The gage below the dam at Baldwinsville was established to determine the head at the mills in connection with the record of discharge, and is also used to determine the elevation of water-surface. A box-and-chain gage is located on the up-stream side of the D., L. & W. railroad bridge near the left-hand end of the bridge. The standard datum of the gage is at elevation 361.75; the chain length 12.77 feet. Readings are taken each morning and night by Charles Brannock.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River below Baldwinsville Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	365.20	*a*	365.02	365.77	365.25	364.05	363.35	363.25	362.50	362.87	363.25	363.90
2	365.42	*a*	365.05	365.65	365.25	364.05	363.35	363.07	362.80	362.85	363.30	363.95
3	365.75	*a*	365.05	365.52	365.25	364.05	363.32	362.80	362.52	362.80	363.40	363.82
4	366.20	*a*	365.10	365.40	365.17	363.92	363.40	362.65	362.45	362.85	363.55	363.75
5	366.88	*a*	365.07	365.22	365.10	363.85	363.45	362.87	362.40	362.80	363.40	363.75
6	367.05	*a*	365.02	365.12	365.05	363.92	363.4	362.87	362.65	362.67	363.50	363.62
7	367.05	*a*	365.00	364.97	364.97	363.92	363.40	362.87	362.70	362.95	363.80	363.47
8	367.20	*a*	364.92	364.95	364.95	363.90	363.42	362.85	362.45	362.90	364.20	363.55
9	367.25	*a*	364.90	364.87	364.87	363.90	363.4	362.97	362.70	362.95	364.45	363.55
10	367.25	*a*	364.75	364.77	364.77	363.82	363.3	362.85	362.67	362.95	364.6	363.62
11	367.22	*a*	364.73	364.67	364.70	363.80	363.27	362.65	362.72	363.00	364.7	363.80
12	367.15	*a*	364.67	364.70	364.70	363.77	363.25	362.9	362.80	363.15	364.75	363.95
13	367.02	*a*	364.73	364.65	......	363.75	363.25	362.75	362.80	363.15	364.7	363.97
14	366.98	*a*	364.95	364.62	......	363.72	363.27	362.75	362.85	363.20	364.6	363.95
15	366.95	*a*	365.10	364.6	364.55	363.70	363.25	362.55	361.60	363.07	364.4	363.77
16	366.92	*a*	365.27	364.57	364.55	363.65	363.25	362.65	362.80	363.07	364.35	363.67
17	367.22	*a*	365.57	364.47	364.55	363.62	363.2	362.60	362.80	363.10	364.07	363.75
18	367.50	*a*	365.63	364.40	364.55	363.52	363.20	362.55	362.72	363.13	364.07	363.85
19	367.22	365.75	365.65	364.30	364.52	363.45	363.25	362.60	362.75	363.10	363.92	363.97
20	366.50	365.60	365.73	364.27	364.53	363.45	363.20	362.62	362.75	363.00	363.95	363.97
21	367.15	365.48	365.65	364.17	364.40	363.35	363.12	362.60	362.72	363.00	363.93	364.00
22	368.15	365.40	365.65	364.13	364.30	363.37	363.15	362.60	362.55	362.97	363.93	363.95
23	*a*	365.50	365.65	364.03	364.25	363.42	363.05	362.62	362.85	363.07	363.85	364.15
24	*a*	365.15	365.77	363.95	364.23	363.40	363.15	362.55	362.77	363.10	363.75	364.73
25	*a*	365.15	365.90	364.00	364.13	363.35	363.35	362.47	362.75	363.05	363.77	365.30
26	*a*	365.08	365.93	364.52	364.25	363.32	363.40	362.67	362.57	363.05	363.67	365.63
27	*a*	365.08	365.87	365.05	364.30	363.27	363.35	362.55	362.50	362.65	363.65	365.85
28	*a*	365.03	365.95	365.20	364.25	363.20	363.22	362.55	362.65	363.10	363.7	366.10
29	*a*	......	365.95	365.27	364.20	363.25	363.25	362.50	362.65	363.17	363.8	366.15
30	*a*	......	365.95	365.30	364.15	363.32	363.25	362.50	362.85	363.17	363.9	366.20
31	*a*	......	365.85	......	364.07	......	363.27	362.57	......	363.20		366.30

a Ice obstruction.

SENECA RIVER ABOVE BALDWINSVILLE DAM.

The elevation of water-surface above Baldwinsville dam is determined from the readings of the crest gage, which was established for the purpose of gaging the discharge. The gage is vertical and reads from zero to 8 feet and is divided to feet and tenths by galvanized staples. It is attached to the down-stream face of the river wall at the up-stream end of the left-hand abutment of the dam. The zero mark of the gage is at elevation 372.27, which is also the elevation of the masonry crest of the dam. When the water is drawn below the crest level the readings are taken by measuring downward from the zero mark on the gage. The reader is Charles Brannock and readings are taken each morning and night.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Baldwinsville Dam.

DAY	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	375.09	374.65	373.95	374.67	374.45	373.79	373.87	371.97	369.92	372.02	373.56	374.47
2	375.09	374.65	374.02	374.62	374.47	373.79	373.82	371.57	370.72	372.37	373.57	374.25
3	375.19	374.75	374.35	374.55	374.42	373.69	373.79	371.77	370.82	372.52	373.99	374.12
4	375.57	374.67	374.17	374.47	374.39	373.64	373.94	372.72	370.67	372.72	373.82	374.05
5	375.39	374.65	374.17	374.42	374.47	373.69	373.87	372.84	370.47	372.89	373.79	374.02
6	375.59	374.67	374.09	374.32	374.37	373.69	373.84	373.37	370.47	373.19	373.82	373.99
7	375.49	374.67	374.07	374.35	374.32	373.79	373.89	373.42	370.22	373.05	374.02	373.97
8	375.57	374.57	374.02	374.25	374.29	373.77	373.72	373.39	371.10	372.97	374.22	374.17
9	375.57	374.55	374.02	374.19	374.29	373.82	373.67	372.89	371.52	373.15	374.42	373.95
10	375.57	374.67	374.27	374.15	373.72	373.64	373.62	372.27	371.27	373.32	374.69	373.92
11	375.55	374.52	374.05	374.12	374.27	373.59	373.54	372.67	371.42	373.52	374.62	374.15
12	375.55	374.35	374.02	374.09	374.35	373.52	373.57	372.57	371.77	373.55	374.62	374.27
13	375.57	374.30	374.09	374.09	374.17	373.52	373.67	370.87	371.72	373.79	374.59	374.27
14	375.49	374.32	374.27	374.17	374.19	373.47	373.79	370.35	371.85	373.49	374.49	374.22
15	375.47	374.27	374.45	374.07	374.12	373.56	373.64	370.17	371.82	373.47	374.45	374.32
16	375.42	374.25	374.67	374.05	374.19	373.57	373.52	370.12	372.05	373.49	374.47	374.09
17	375.39	374.47	374.97	374.05	374.17	373.39	373.52	370.02	371.35	373.49	374.47	374.19
18	375.42	374.30	375.05	373.97	374.17	373.32	373.49	370.57	371.55	373.42	374.22	374.27
19	375.05	374.30	375.12	373.99	374.27	373.32	373.44	370.42	371.62	373.45	374.15	374.32
20	375.27	374.27	374.72	373.95	374.15	373.22	373.49	370.42	371.70	373.75	374.12	374.32
21	375.17	374.22	374.72	374.02	374.05	373.82	373.69	369.75	372.32	373.47	374.09	374.29
22	375.02	374.17	374.72	373.89	374.02	373.87	373.44	369.72	371.62	373.45	374.12	374.47
23	374.82	374.05	374.77	373.79	373.92	374.09	373.47	369.80	371.90	373.47	374.17	374.37
24	374.67	374.22	374.87	373.85	373.87	373.94	373.34	370.07	372.12	373.17	374.32	374.69
25	374.57	373.97	374.82	373.97	373.87	373.87	373.59	370.67	371.87	372.97	374.02	375.02
26	374.62	373.85	374.77	374.12	373.99	373.84	373.54	370.32	371.97	372.62	374.02	375.05
27	374.77	373.82	374.79	374.27	373.97	373.79	373.59	369.67	371.77	373.37	374.02	375.15
28	374.62	373.87	374.79	374.49	373.95	373.77	373.67	369.67	371.67	373.55	374.19	375.22
29	374.62	......	374.79	374.45	373.92	373.82	373.22	369.62	373.04	373.49	374.12	375.27
30	374.65	......	374.75	374.45	373.92	373.97	372.87	369.67	372.77	373.52	374.19	375.25
31	374.65	......	374.77	......	373.85	......	372.45	369.65	......	373.52	......	375.29

Mean Daily Discharge, Second-feet, of Seneca River at Baldwinsville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	5,341	4,242	2,712	5,630	5,426	3,842	2,918	2,057	625	1,959	2,477	3,114
2	5,742	4,226	2,829	5,507	5,476	3,039	2,846	2,063	1,245	2,048	2,583	3,610
3	5,775	3,731	2,814	5,423	5,326	3,829	2,767	2,054	1,267	2,048	2,249	3,386
4	6,579	4,285	3,304	5,127	5,171	3,884	1,989	1,311	1,277	2,121	2,850	3,284
5	6,511	4,242	3,320	5,261	4,623	3,950	1,597	1,892	1,405	2,127	2,924	3,217
6	6,346	4,105	3,166	4,736	5,150	3,861	2,634	2,151	1,497	1,253	2,885	3,163
7	6,820	4,105	3,129	4,087	5,070	4,132	2,068	2,205	1,322	2,138	2,164	3,083
8	7,115	4,057	3,033	4,775	4,996	4,003	2,829	1,998	839	2,128	3,539	2,404
9	7,143	3,982	3,006	4,667	4,980	3,160	2,782	1,903	1,426	2,135	4,012	2,976
10	7,143	3,526	2,633	4,591	4,779	3,773	2,711	1,893	1,375	2,397	3,619	2,893
11	7,041	3,924	3,071	4,514	4,942	3,738	2,424	1,311	1,137	2,595	4,525	3,366
12	7,038	3,507	3,013	4,446	4,241	3,525	2,643	2,213	1,801	2,675	4,587	3,588
13	6,282	3,378	3,146	4,388	4,912	3,519	2,628	1,923	1,690	1,806	4,513	3,588
14	6,864	3,296	3,461	3,729	4,964	3,432	1,883	1,714	1,415	2,454	4,267	3,332
15	6,717	3,107	3,855	4,499	4,704	3,365	2,737	1,663	898	2,458	4,136	2,712
16	6,623	3,097	4,381	4,454	4,952	2,695	2,578	1,663	1,671	2,409	4,201	3,291
17	6,358	3,038	4,403	4,454	4,775	3,123	2,578	1,511	1,587	2,409	3,140	3,476
18	6,488	3,352	5,423	4,275	4,742	3,245	2,532	1,038	1,671	2,377	3,541	3,596
19	5,417	3,351	5,570	4,319	4,045	3,214	2,418	1,679	1,671	2,376	3,405	3,729
20	5,337	3,402	5,817	4,010	4,754	2,995	2,284	1,448	1,640	1,742	3,349	3,690
21	5,565	3,398	5,817	3,393	4,486	2,850	1,843	1,247	1,735	2,510	3,294	3,645
22	3,944	3,302	5,870	3,934	4,463	2,913	2,319	1,114	1,119	2,510	3,251	3,081
23	3,523	3,007	5,942	3,657	4,255	2,392	2,353	978	1,990	2,527	3,388	3,746
24	3,164	2,599	5,423	3,840	4,143	2,865	2,121	1,000	1,879	2,247	2,771	4,395
25	2,920	2,801	6,051	4,375	4,076	2,801	2,659	823	1,784	2,239	3,174	4,597
26	4,110	2,588	5,915	4,667	3,416	2,768	2,604	1,196	1,732	2,101	3,184	5,596
27	4,292	2,530	5,825	4,824	4,199	2,671	2,509	1,119	1,610	1,279	3,168	5,880
28	4,187	2,626	5,825	4,432	4,170	2,616	1,794	1,076	1,770	2,596	2,050	6,037
29	4,187	......	5,826	5,332	4,005	2,673	2,344	983	1,151	2,546	3,519	5,595
30	4,144	......	5,725	5,355	3,694	3,203	2,212	1,115	1,855	2,585	3,339	6,113
31	4,177	......	5,134	......	3,998	......	2,164	1,065	......	2,550	......	6,192
Mean	5,545	3,454	4,369	4,559	4,611	3,269	2,413	1,529	1,470	2,237	3,337	3,883

Monthly Discharge of Seneca River at Baldwinsville Dam.
[Drainage area, 3,103 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	7,143	2,920	5,545	1.79	2.06
February	4,285	2,530	3,454	1.11	1.15
March	6,051	2,633	4,369	1.41	1.62
April	5,630	3,393	4,559	1.47	1.65
May	5,476	3,416	4,611	1.48	1.70
June	4,132	2,392	3,269	1.05	1.18
July	2,918	1,597	2,413	0.777	0.894
August	2,213	823	1,529	0.492	0.566
September	1,990	625	1,470	0.473	0.530
October	2,675	1,253	2,237	0.72	0.828
November	4,587	2,050	3,337	1.07	1.20
December	6,192	2,404	3,883	1.25	1.44

SENECA RIVER AT FOOT OF JACK'S REEF.

A gage was established on Seneca river below Jack's Reef, April 20, 1904, by this Department. The gage is attached to a willow tree on the left bank of the stream and is located a few hundred feet below the entrance of the State ditch and also below a series of eel weirs at Jack's Reef. The gage is vertical and reads from zero to 9 feet and is subdivided to tenths by coppered staples. Readings are taken by Frank Burns at 8 A. M. each day. The zero of the gage is at elevation 371.80.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at foot of Jack's Reef.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	376.47	376.37	375.57	376.67	376.27	375.07	374.77	374.47	......	373.67	374.27	......
2	376.67	376.37	375.47	376.47	376.27	......	374.87	374.37	373.37	373.67	374.27	375.07
3	376.97	......	......	376.27	376.17	374.97	374.87	374.27	373.37	373.67	......	375.07
4	377.27	376.67	375.67	376.17	376.07	374.87	374.97	......	373.47	373.87	374.67	374.97
5	377.47	376.57	375.67	376.07	......	374.87	374.97	374.47	373.47	373.97	374.67	374.87
6	......	376.57	375.67	375.97	376.07	374.97	374.97	374.67	373.47	......	374.77	374.77
7	377.57	376.47	375.57	......	375.97	375.07	......	374.67	373.47	374.07	374.97	374.67
8	377.77	376.27	375.57	375.87	375.97	375.07	374.87	374.67	......	373.87	375.17	......
9	377.87	376.07	375.47	375.77	375.87	......	374.87	374.57	373.67	374.17	375.37	374.67
10	377.77	......	......	375.67	375.77	374.97	374.87	374.37	373.57	374.17	......	374.67
11	377.67	376.17	375.47	375.57	375.67	374.87	374.87	......	373.67	374.27	375.67	374.87
12	377.57	376.17	375.37	375.57	......	374.77	374.87	374.27	373.67	374.37	375.67	375.07
13	......	376.07	375.47	375.57	375.67	374.77	374.87	373.97	373.77	......	375.67	375.17
14	377.67	376.07	375.67	......	375.67	374.67	......	373.87	373.67	374.47	375.57	375.27
15	377.57	375.97	375.97	375.67	375.57	374.57	374.97	373.77	......	374.27	375.47	......
16	377.47	375.87	376.27	375.57	375.57	......	374.97	373.67	373.67	374.37	375.37	374.97
17	377.27	......	......	375.47	375.67	374.57	374.97	373.57	373.57	374.27	......	374.97
18	377.07	375.97	376.77	375.37	375.67	374.47	374.97	......	373.57	374.27	375.17	375.17
19	376.87	375.87	376.87	375.27	......	374.37	374.97	373.67	373.57	374.17	375.07	375.27
20	......	375.87	376.97	375.17	375.67	374.57	374.87	373.67	373.47	......	374.97	375.37
21	376.97	375.77	376.77	......	375.57	374.57	......	373.57	373.67	374.17	375.07	375.37
22	376.87	375.77	376.67	375.17	375.47	374.77	374.97	373.57	......	374.07	375.07	......
23	376.77	375.67	376.77	375.07	375.37	......	374.97	373.57	373.97	374.07	374.97	375.37
24	376.67	......	......	375.17	375.27	374.77	374.97	373.57	373.77	373.97	......	375.77
25	376.57	375.77	376.87	375.37	375.17	374.77	375.17	......	373.67	373.87	374.87	376.17
26	376.47	375.67	376.77	375.57	......	374.77	375.17	373.57	373.77	373.67	374.87	376.47
27	......	375.67	376.77	375.87	375.37	374.67	375.07	373.47	373.87	......	374.87	376.67
28	376.67	375.57	376.77	......	375.37	374.77	......	373.47	373.77	374.27	374.87	376.77
29	376.57	......	376.77	376.17	375.27	374.77	374.97	373.47	......	374.27	374.97	......
30	376.47	......	376.77	376.17	375.27	......	374.77	373.47	373.97	374.27	375.07	376.97
31	376.47	......	376.77	......	375.17	......	374.67	373.47	......	374.27	......	377.07

SENECA RIVER ABOVE JACK'S REEF.

A gage was established on the Seneca river above Jack's Reef and near the head of the State ditch, April 20, 1904, by this Department. Several gages have been used. The readings have been taken during 1907 from a vertical gage attached to a large tree on the right-hand bank of the stream below the old cofferdam at the head of the State ditch. During 1907 the water fell below the zero mark of the gage at times and the record for the low-water period is approximate only. The bench-mark used to determine the elevation of the gage zero is a nail in the root of a large poplar tree, to which the gage is attached. The bench-mark is at elevation 382.482.

The gage datum has frequently been changed. During 1907 it was as follows: April 20, 1906, to March 24, 1907, 374.81; March 25 to May 17, 1907, 377.07; May 18 to December 31, 1907, 375.44. Readings are taken each morning by John P. Watts. The gage is located one-half mile below the outlet of Cross lake and is about 4 miles north of the village of Jordan.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Jack's Reef.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	378.17	*a*	*a*	379.57	378.87	377.27	376.24	375.34	375.34	374.84	375.74	......
2	378.37	*a*	*a*	379.07	378.57	......	376.24	375.34	375.34	374.94	375.94	376.84
3	378.87	*a*	*a*	378.87	378.47	377.17	376.34	375.24	375.34	374.94	......	376.74
4	379.27	*a*	*a*	378.77	378.47	377.17	376.34	......	375.34	374.94	375.94	376.54
5	379.57	*a*	*a*	378.67	......	377.17	376.34	375.14	375.24	374.94	375.94	376.54
6	......	*a*	*a*	378.47	378.47	377.27	376.34	375.14	375.2	......	376.14	376.44
7	379.37	*a*	*a*	......	378.47	377.37	......	375.04	375.1	375.04	376.44	376.34
8	379.57	*a*	*a*	378.27	378.47	377.27	376.34	375.04	375.14	375.14	377.24	......
9	379.77	*a*	*a*	378.27	378.47	......	376.24	375.04	375.04	375.44	377.64	376.34
10	379.57	*a*	*a*	378.17	378.37	377.17	376.24	374.94	374.94	375.54	......	376.34
11	379.57	*a*	*a*	378.07	378.37	377.17	376.14	......	374.84	375.64	377.67	376.34
12	379.37	*a*	*a*	377.97	......	377.07	376.14	374.84	374.74	375.84	377.67	376.44
13	......	*a*	*a*	377.97	378.17	377.07	376.14	374.74	374.74	......	377.67	376.74
14	379.47	*a*	*a*	......	378.07	377.07	......	374.64	374.74	375.84	377.47	376.94
15	379.27	*a*	*a*	377.97	377.97	377.07	376.04	374.64	374.74	375.84	377.27	......
16	379.17	*a*	*a*	377.87	377.97	......	376.04	374.54	374.74	375.84	377.17	376.64
17	378.77	*a*	*a*	377.87	377.87	377.07	376.04	374.54	374.74	375.84	......	376.84
18	378.67	*a*	*a*	377.77	377.97	......	376.04	......	374.84	375.84	377.04	376.94
19	378.67	*a*	*a*	377.77	......	376.64	375.94	374.54	374.84	375.94	376.94	377.14
20	......	*a*	*a*	377.77	377.97	376.54	375.94	375.44	374.74	......	376.84	377.14
21	378.87	*a*	*a*	......	377.87	376.54	......	374.44	374.74	375.84	376.74	377.14
22	378.77	*a*	*a*	377.37	377.77	376.44	375.84	374.44	374.84	375.74	376.64	......
23	378.37	*a*	*a*	377.27	377.57	376.34	375.94	374.44	374.84	375.64	376.64	377.44
24	378.27	*a*	*a*	377.67	377.47	376.34	375.94	374.34	374.84	375.54	......	377.74
25	378.17	*a*	379.57	377.87	377.47	376.34	376.24	......	374.84	375.34	376.64	378.44
26	378.27	*a*	379.57	378.27	......	376.24	376.14	374.34	374.74	375.24	376.64	378.94
27	......	*a*	379.47	378.57	377.47	376.24	376.04	374.34	374.74	......	376.74	379.04
28	377.87	*a*	379.47	......	377.37	376.24	......	374.34	374.74	375.54	376.84	379.14
29	377.87	......	379.57	378.87	377.37	376.14	375.84	374.34	374.74	375.54	376.84	......
30	377.87	......	379.57	378.97	377.37	......	375.64	374.34	374.74	375.54	376.84	379.34
31	377.87	......	......	......	377.27	......	375.53	374.34	......	375.54	......	379.44

a No record on dates left blank.

SENECA RIVER AT HIGHWAY BRIDGE ABOVE CROSS LAKE.

A gage was erected May 1, 1904, by H. U. Lyon of this Department at the highway bridge, commonly known as "Iron Bridge," over the Seneca river about one-half mile above Cross lake, for the purpose of obtaining a record of the fluctuation of the water-surface of the river at this point and of Cross lake. The elevation of water-surface is practically the same, there being very little appreciable slope in the river between the lake and the gaging station, except, perhaps, in time of high water.

The gage is a vertical board, graduated in feet and tenths, and is fastened to a willow tree on bank of river, on up-stream side of bridge, about 20 feet from south abutment, with its zero mark at elevation 373.30. Observations of the stage of the stream are taken daily by Ed. Carlton.

Current-meter measurements were made at this station in 1905.

The current of the stream is sluggish, especially during low water, but quite uniform. The river channel is of mud and straight for a considerable distance each way from the bridge.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River near Cross Lake.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	378.70	378.50	377.65	379.29	378.99	377.39	376.29	375.49	......	374.94	375.74	376.89
2	379.10	378.50	377.60	379.19	378.89	377.39	376.19	375.39	. ...	374.94	375.89	376.89
3	379.40	378.60	377.60	378.99	378.79	377.29	376.19	375.39	......	374.94	376.04	376.89
4	379.80	378.55	377.60	378.89	378.79	377.19	376.19	375.39	......	375.09	376.19	376.79
5	380.10	378.50	377.55	378.79	378.69	377.19	376.19	375.34	.....	375.09	376.24	376.74
6	380.20	378.50	377.55	378.59	378.59	377.29	376.19	375.34	......	375.09	376.29	376.49
7	380.60	378.50	377.60	378.49	378.59	377.29	376.19	375.29	....	375.19	376.44	376.44
8	380.60	378.40	377.60	378.39	378.49	377.19	376.19	375.29	......	375.39	376.99	376.39
9	380.70	378.45	377.60	378.29	378.49	377.19	376.09	375.19	......	375.57	377.34	376.29
10	380.70	378.50	377.60	378.29	378.39	377.19	376.19	375.19	....	375.74	377.74	376.44
11	380.60	378.50	377.60	378.19	378.39	377.19	376.19	375.14	......	375.89	377.79	376.74
12	380.50	378.40	377.65	377.99	378.39	377.19	376.19	375.09	......	375.89	377.84	377.04
13	380.30	378.30	377.70	377.99	378.29	377.09	376.09	374.99	......	375.89	377.69	377.09
14	380.10	378.20	378.55	377.99	378.29	376.99	376.09	374.99	......	375.79	377.54	377.04
15	379.90	378.10	378.15	378.24	378.19	376.89	376.09	374.99	374.89	375.79	377.34	376.69
16	379.70	378.00	378.40	377.89	378.19	376.79	375.99	374.89	374.89	375.79	377.19	376.69
17	379.40	377.90	378.25	377.89	378.09	376.69	375.99	374.89	374.89	375.79	377.09	376.94
18	379.30	377.95	379.00	377.79	378.09	376.69	375.99	374.79	374.89	375.79	376.94	377.14
19	379.30	378.00	379.30	377.69	377.99	376.59	375.99	374.79	374.89	375.59	376.84	377.29
20	379.70	378.00	379.40	377.59	377.99	376.49	375.99	374.79	374.79	375.49	376.79	377.24
21	379.60	377.95	379.40	377.49	377.89	376.49	375.99	374.79	374.89	375.49	376.84	377.19
22	379.40	377.90	379.40	377.39	377.82	376.49	375.89	374.79	374.94	375.39	376.89	377.19
23	379.10	377.90	379.35	377.49	377.79	376.39	375.89	374.79	374.99	375.49	376.79	377.24
24	378.80	377.80	379.40	377.59	377.79	376.39	375.99	374.79	374.94	375.39	376.69	377.79
25	378.55	377.60	379.50	377.89	377.79	376.29	376.59	374.69	374.99	375.39	376.59	378.44
26	378.40	377.60	379.50	378.19	377.79	376.29	375.99	374.79	374.89	375.39	376.49	378.84
27	378.35	377.65	379.50	378.59	377.79	376.19	375.89	374.79	374.89	375.54	376.49	379.14
28	378.40	377.70	379.59	378.69	377.79	376.19	375.89	374.69	374.89	375.61	376.64	379.34
29	378.45	....	379.59	378.79	377.69	376.19	375.79	374.69	374.89	375.69	376.79	379.59
30	378.45	.....	379.49	378.79	377.59	376.29	375.69	374.69	374.89	375.84	376.89	379.69
31	378.40	....	379.49	....	377.49	.....	375.59	374.69	......	375.79	......	379.79

SENECA RIVER AT MOSQUITO POINT BRIDGE.

A gage was established at Mosquito Point bridge on Seneca river by this Department, April 21, 1904. During 1907 a vertical gage attached to a post set in the reed beds at the left-hand side of the stream above the bridge has been used. The gage is divided decimally by burned marks and reads from zero to 9 feet. The zero mark was at elevation 372.81, May 12, 1906, to April 28, 1907, and at elevation 375.85, beginning April 28, 1907. The water-level fell below the gage zero at times during 1907 and the record is defective during the low-water period. Readings are taken each morning by William Prettie. The gage is located 3 miles north of Port Byron and is just below the entrance of Owasco lake outlet to Seneca river.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at Mosquito Point Bridge.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	382.6	380.3	378.1	380.2	380.0	378.4	377.0	376.2	375.2	375.8	376.3	377.8
2	382.8	380.2	378.2	380.0	380.0	378.4	377.2	376.0	375.2	375.8	376.5	377.8
3	383.1	380.1	378.3	379.8	380.0	378.2	377.4	376.0	375.2	375.8	376.7	378.0
4	383.6	380.0	378.4	379.6	380.0	378.2	377.2	375.8	375.2	375.8	376.7	377.8
5	381.0	379.9	378.5	379.4	379.8	378.2	377.4	375.8	375.4	375.8	376.8	377.6
6	381.4	379.8	378.4	379.3	379.8	378.4	377.4	375.8	375.6	375.8	376.9	377.2
7	381.5	379.9	378.5	379.2	379.8	378.4	377.2	375.8	375.6	375.8	377.0	377.2
8	381.7	379.8	378.2	379.1	379.6	378.2	377.2	375.8	375.6	376.2	377.8	377.2
9	381.7	379.7	378.2	379.1	379.6	378.2	377.2	375.8	375.6	376.4	378.3	377.0
10	381.7	379.6	378.2	379.0	379.4	378.2	377.0	375.8	375.6	376.6	378.6	377.2
11	381.6	379.5	378.1	378.9	379.4	378.0	377.0	375.6	375.6	376.6	378.6	377.6
12	381.5	379.3	378.1	378.8	379.2	378.0	377.0	375.6	375.8	376.6	378.5	378.0
13	381.4	379.1	378.2	378.9	379.2	377.8	377.0	375.4	375.6	376.6	378.3	377.8
14	381.3	379.0	378.7	378.9	379.2	377.8	377.0	375.4	375.6	376.6	378.1	377.6
15	381.3	378.9	379.2	378.8	379.2	377.6	377.0	375.4	375.6	376.4	377.9	377.6
16	381.1	378.9	379.5	378.7	379.2	377.6	377.0	375.4	375.6	376.4	377.8	377.6
17	381.1	378.9	379.9	378.6	379.2	377.6	377.0	375.4	375.6	376.4	377.6	378.2
18	381.0	378.9	380.1	378.5	379.2	377.4	377.0	375.4	375.6	376.4	377.5	378.2
19	380.9	378.8	380.3	378.5	379.2	377.4	376.8	375.2	375.6	376.2	377.4	378.0
20	380.9	378.7	380.3	378.4	379.0	377.4	376.8	375.2	375.6	376.2	377.3	378.0
21	380.8	378.7	380.3	378.3	379.0	377.4	376.8	375.2	375.6	376.2	377.4	378.0
22	381.0	378.6	380.4	378.1	378.8	377.4	376.7	375.2	375.6	376.2	377.5	378.0
23	381.2	378.4	380.5	378.0	378.8	377.4	376.7	375.2	375.6	376.2	377.3	378.2
24	381.0	378.3	380.5	378.3	378.6	377.2	376.8	375.2	375.8	376.0	377.2	378.8
25	380.9	378.2	380.5	378.6	378.6	377.2	377.0	375.2	375.6	376.0	377.0	379.8
26	380.8	378.1	380.5	379.1	378.6	377.2	376.8	375.2	375.6	376.0	377.1	380.2
27	380.7	378.1	380.4	379.4	378.8	377.0	376.8	375.2	375.6	376.2	377.1	380.2
28	380.6	378.1	380.4	380.0	378.6	377.0	376.6	375.2	375.6	376.4	377.2	380.6
29	380.6	......	380.4	380.0	378.6	377.0	376.4	375.2	375.6	376.6	377.5	380.8
30	380.5	......	380.4	380.2	378.6	377.0	376.4	375.2	375.6	376.6	377.7	380.8
31	380.4	......	380.3	......	378.4	......	376.2	375.2	......	376.6	......	381.0

SENECA RIVER AT N. Y. C. R. R. BRIDGE NEAR FOX RIDGE, N. Y.

This gage is located on the N. Y. C. railroad bridge crossing Seneca river and Montezuma marsh 1¼ miles west of Fox Ridge station. The gage was established by this Department, May 4, 1904. Readings are taken each morning by J. H. Rupert, engineer in the adjacent pumping station. The gage is located on the ties of the up-stream track at the left-hand side of the stream. A box-and-chain gage is used. The elevation of water-surface, when the gage reads zero, is 376.50. The chain length is 14.34

feet. The gage was defective during 1907 and the record is approximate only.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at N. Y. C. R. R. Bridge near Fox Ridge, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	381.8	382.3	380.4	381.9	381.7	380.6	379.5	378.3	377.5	378.1	378.6	379.6
2	382.0	382.4	380.6	381.7	381.6	380.6	379.7	378.2	377.4	378.0	378.7	379.5
3	382.3	382.3	380.8	381.5	381.5	380.5	379.7	378.2	377.4	377.9	378.8	379.4
4	382.5	382.2	380.8	381.3	381.5	380.4	379.7	378.1	377.3	378.1	378.9	379.2
5	382.9	382.1	380.7	381.2	381.4	380.6	379.6	378.0	377.3	378.1	379.0	379.0
6	383.0	381.9	380.7	381.1	381.4	380.5	379.5	377.9	377.8	378.1	379.1	378.9
7	383.1	381.8	380.7	381.1	381.4	380.5	379.5	377.9	377.7	378.2	379.3	378.9
8	383.3	381.7	380.6	381.0	381.3	380.4	379.5	377.8	377.6	378.3	380.0	378.9
9	383.3	381.6	380.5	380.9	381.3	380.3	379.5	377.8	377.6	378.6	380.6	379.0
10	383.2	381.5	380.4	380.7	381.2	380.2	379.4	377.7	377.8	378.8	380.8	379.2
11	383.1	381.4	380.3	380.6	381.2	380.1	379.4	377.7	378.0	378.7	380.7	379.4
12	383.0	381.3	380.3	380.6	381.1	380.1	379.5	377.6	378.0	378.6	380.5	379.8
13	383.0	381.2	380.5	380.7	381.1	380.1	379.4	377.6	377.9	378.5	380.3	379.7
14	383.0	381.1	381.0	380.7	381.1	380.1	379.4	377.5	377.9	378.5	380.1	379.6
15	383.1	381.0	381.2	380.6	381.0	379.9	379.4	377.4	377.9	378.5	379.9	379.8
16	383.1	381.1	381.4	380.6	381.0	379.8	379.3	377.5	378.0	378.4	379.8	380.0
17	383.0	381.1	381.8	380.5	381.1	379.7	379.3	377.6	378.0	378.4	379.8	379.9
18	382.9	381.0	382.0	380.4	381.0	379.6	379.2	377.5	378.0	378.3	379.7	379.8
19	383.0	381.0	382.1	380.3	381.0	379.5	379.1	377.5	378.1	378.3	379.6	379.7
20	383.0	380.9	382.2	380.2	380.9	379.7	379.0	377.4	378.1	378.3	379.5	379.7
21	382.9	380.9	382.3	380.2	380.8	379.6	378.9	377.4	378.1	378.2	379.6	379.6
22	382.9	380.8	382.3	380.1	380.7	379.5	379.0	377.4	378.0	378.2	379.5	379.6
23	382.8	380.7	382.2	380.0	380.6	379.5	378.9	377.4	378.0	378.2	379.3	379.8
24	382.7	380.6	382.2	380.2	380.5	379.4	378.8	377.7	378.0	378.1	379.1	380.5
25	382.6	380.5	382.3	380.9	380.4	379.4	378.7	377.7	377.9	378.1	379.0	381.4
26	382.6	380.5	382.3	381.3	380.7	379.3	378.6	377.6	377.9	378.1	378.9	381.8
27	382.7	380.4	382.2	381.5	381.0	379.3	378.6	377.6	377.8	378.2	379.1	382.1
28	382.7	380.3	382.2	381.7	381.0	379.2	378.5	377.5	377.8	378.5	379.3	382.3
29	382.6	.....	382.1	381.8	380.9	379.2	378.4	377.5	377.9	378.5	379.5	382.4
30	382.5	.....	382.1	381.8	380.8	379.3	378.3	377.4	378.1	378.4	379.7	382.6
31	382.4	.....	382.0	.....	380.7	.....	378.2	377.5	.....	378.4	.....	382.6

SENECA RIVER AT FOOT OF CAYUGA LAKE.

A gage was established by this Department, October 10, 1905, at West Mud Lock, which is at the junction of Seneca river, Cayuga lake and Cayuga and Seneca canal, about 3 miles east from Seneca Falls. A vertical painted gage, reading from zero to 6 feet, is nailed to the docking at the left-hand end of the towing-path bridge crossing Seneca river at the foot of the lake. Readings are taken each morning by Ed. Jones. The gage was defective during part of the year and record for lower stages during 1907 is approximate only.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at the foot of Cayuga Lake.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	384.0	384.4	383.0	383.7	384.0	383.5	382.2	383.2	383.5	383.3	382.9	382.9
2	384.1	384.3	382.9	383.6	384.1	383.5	382.3	383.1	383.2	383.2	382.8	383.0
3	384.3	384.3	382.8	383.7	383.9	383.7	382.4	383.0	383.1	383.0	382.9	383.1
4	384.5	384.3	382.9	383.6	383.8	383.7	382.5	383.1	383.2	382.9	383.0	383.1
5	384.6	384.2	382.8	383.8	383.9	383.4	382.6	383.0	383.3	383.1	382.9	383.0
6	384.5	384.2	382.7	383.7	383.9	383.3	382.7	382.9	383.4	383.0	382.8	382.9
7	384.7	384.1	382.7	383.9	384.0	383.3	382.6	383.0	382.5	382.9	382.9	383.0
8	384.8	384.1	382.6	383.8	383.9	383.1	382.7	382.9	383.4	382.8	383.0	382.8
9	384.9	384.0	382.6	383.7	384.0	383.0	382.8	383.2	383.3	382.9	383.1	382.9
10	384.9	384.0	382.7	383.7	384.1	......	382.9	383.1	383.2	383.0	383.0	382.8
11	385.0	383.6	382.7	383.6	384.0	383.1	382.8	383.0	383.3	383.1	382.9	382.8
12	385.0	383.9	382.8	383.5	383.9	383.2	383.0	382.9	383.1	383.0	383.1	382.7
13	384.9	383.8	382.9	383.4	384.0	383.0	383.1	383.0	383.2	382.9	383.2	382.6
14	385.0	383.8	382.9	383.5	383.9	382.9	382.9	383.1	383.3	382.8	383.1	382.7
15	384.8	383.8	383.0	383.4	383.9	383.1	383.0	383.0	383.4	382.7	383.0	382.5
16	384.8	383.7	383.1	383.3	384.0	383.2	383.1	383.0	382.5	382.8	382.9	382.6
17	384.8	383.7	383.2	383.2	383.9	383.3	383.2	383.1	382.5	382.7	383.1	382.4
18	384.7	383.6	383.1	383.0	383.8	383.1	383.3	383.2	383.4	382.8	383.2	382.3
19	385.0	383.6	383.2	382.9	383.9	383.0	383.2	383.0	383.3	382.6	383.0	382.2
20	384.8	383.5	383.3	382.9	383.8	382.9	383.1	383.1	383.2	382.5	382.9	382.3
21	384.8	383.5	383.2	383.0	383.7	383.0	383.0	383.1	383.3	382.6	382.8	382.1
22	384.7	383.4	383.3	383.0	383.6	382.8	383.1	383.0	383.4	382.4	383.0	382.2
23	384.7	383.5	383.4	383.1	383.7	382.6	383.2	382.9	382.5	382.3	383.2	382.3
24	384.6	383.4	383.5	383.3	383.6	382.4	383.0	383.0	382.5	382.5	383.3	382.4
25	384.7	383.3	383.6	383.5	383.5	382.3	382.9	383.1	383.4	382.5	383.4	382.6
26	384.6	383.3	383.7	383.6	383.4	382.4	383.0	383.0	383.2	382.6	383.2	382.7
27	384.6	383.2	383.6	383.7	383.5	382.2	383.1	383.2	383.1	382.5	383.1	382.8
28	384.5	383.1	383.7	383.8	383.6	382.1	383.0	383.2	383.2	382.6	383.0	383.0
29	384.4	......	383.8	383.8	383.7	382.2	383.1	383.1	383.3	382.7	382.9	383.1
30	384.4	......	383.8	383.9	383.6	382.3	383.2	383.0	382.5	382.7	383.0	383.2
31	384.3	......	383.7	......	383.5	......	383.3	383.2	......	382.8	......	383.3

CLYDE RIVER AND GANARGUA CREEK.

DESCRIPTION.

Clyde river joins Seneca river in the Montezuma marsh near the foot of Cayuga lake. Clyde river is formed by the junction of Canandaigua outlet and Ganargua creek, at Lyons. Its total length is about 20 miles and the greater portion of its course lies through a broad, marshy valley. Ganargua creek proper rises near Victor. Its course is northeasterly to Macedon. It then flows easterly, winding broadly through the system of duplicate valleys extending easterly from Macedon. The principal tributary of Ganargua creek is Mud creek, which rises in the hilly region near the head of Canandaigua lake and flows northward about 20 miles, entering Ganargua creek at Victor. Ganargua creek is often called Mud creek throughout its course to Lyons. The valley through which it flows is, however, called Ganargua valley. The tributary drainage is of the characteristic glacial kame type and the tributaries are rather sparse, flowing oftentimes first north and then south between elongated hills, until they find their way to Ganargua creek.

CLYDE RIVER AT CLYDE, N. Y.

A gage was established at Sodus street bridge in the village of Clyde, October 20, 1905, by E. V. R. Payne, of this Department. A gage of the box-and-chain type is used. The scale is divided decimally from zero to 8 feet. The elevation of water-surface, when the gage reads zero, is 380.00. The chain length is 22.09. The gage is located on the down-stream side of the central span of the bridge. The bridge has a total length between abutments of 174 feet. It is subdivided into 5-foot sections on the down-stream side for current-meter measurements, the initial point being the face of the right-hand abutment. Readings are taken each day by J. F. Wickham.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Clyde River at Clyde, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	385.8	384.6	382.6	383.8	383.7	381.8	381.7	381.8	381.5	381.5	381.3	382.0
2	386.0	384.5	382.6	383.4	383.5	381.7	381.7	381.8	381.5	381.4	381.3	381.9
3	386.2	384.5	384.0	383.1	383.5	381.7	381.6	381.8	381.5	381.4	381.6	381.8
4	386.6	384.3	384.4	383.0	383.5	381.7	381.5	381.8	381.5	381.4	381.8	381.6
5	387.3	384.1	383.6	382.9	383.4	381.7	381.5	381.8	381.5	381.5	381.7	381.6
6	388.1	383.9	383.1	382.9	383.3	381.8	381.5	381.7	381.5	381.4	381.7	381.6
7	387.7	383.7	383.0	382.9	383.1	381.7	381.5	381.7	381.5	381.4	381.9	381.6
8	387.0	383.6	382.9	382.8	383.0	381.7	381.5	381.7	381.8	381.8	383.9	381.5
9	386.8	383.5	382.8	382.6	383.0	381.6	381.5	381.7	381.6	382.0	384.3	381.5
10	386.8	383.5	382.7	382.5	382.9	381.6	381.5	381.7	381.6	381.8	383.7	381.6
11	386.4	383.3	382.7	382.6	382.9	381.5	381.5	381.7	381.6	381.6	382.9	382.0
12	386.0	383.1	382.7	383.0	383.0	381.4	381.6	381.7	381.6	381.5	382.4	382.1
13	385.4	383.1	382.9	383.1	382.9	381.4	381.6	381.7	381.5	381.5	382.1	382.0
14	385.2	383.1	385.2	383.0	382.8	381.4	381.6	381.7	381.4	381.5	381.9	381.9
15	385.4	383.1	385.6	382.8	382.7	381.4	381.6	381.6	381.4	381.5	381.8	382.2
16	384.9	383.1	386.3	382.7	382.7	381.4	381.6	381.6	381.3	381.5	381.8	381.9
17	385.3	383 1	387.3	382.5	382.6	381.4	381.6	381.6	381.3	381.5	381.7	381.8
18	385.8	383.1	387.8	382.4	382.4	381.3	381.6	381.6	381.3	381.4	381.6	381.8
19	385.8	383.0	387.9	382.3	382.4	381.3	381.6	381.6	381.3	381.3	381.6	381.8
20	385.7	382.8	387.5	382.2	382.3	381.4	381.6	381.6	381.3	381.3	381.6	381.9
21	385.7	382.9	386.7	382.0	382.1	381.5	381.6	381.6	381.3	381.4	381.6	381.8
22	386.7	383.0	385.9	382.0	382.1	381.4	381.7	381.6	381.5	381.3	381.7	381.7
23	386.6	383.0	385.8	382.0	382.0	381.3	381.8	381.6	381.4	381.2	381.6	381.8
24	386.3	383.0	385.8	382.8	381.9	381.3	381.8	381.6	381.4	381.2	381.6	384.4
25	386.2	382.9	385.7	384.0	381.9	381.4	381.8	381.6	381.4	381.2	381.6	385.4
26	386.1	382.9	385.2	384.2	382.1	381.3	381.8	381.6	381.4	381.2	381.7	385.8
27	385.8	382.8	384.8	384.7	382.4	381.3	381.8	381.5	381.3	381.2	381.8	386.2
28	385.5	382.6	385.1	384.8	382.2	381.3	381.8	381.6	381.3	381.5	381.9	386.2
29	385.2	.....	385.1	384.9	382.1	381.3	381.8	381.6	381.5	381.5	382.1	386.4
30	384.9	.....	385.0	384.9	381.9	381.4	381.7	381.6	381.5	381.4	382.1	386.5
31	384.7	.....	384.3	.....	381.8	.....	381.7	381.6	.....	381.4	.....	386.5

Current-meter Discharge Measurements of Clyde River at Clyde, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
April 11	Niles and Davis	2.60	......	396	1.92	762
June 6	E. C. Niles	1.82	......	375	1.52	571
July 1	Weeks and Niles	1.65	......	361	1.12	406
July 1	Weeks and Niles	1.65	......	387	0.98	*a*381
July 2	Weeks and Niles	1.75	......	366	1.19	437
Aug. 15	E. C. Niles	1.60	......	325	0.28	*b*92.1
Sept. 25	E. C. Niles	1.42	......	306	0.54	165

a Up-stream side of bridge.
b Grass obstruction.

CLYDE RIVER AT LYONS, N. Y.

A gage was established at Geneva street bridge in the village of Lyons, September 25, 1905, by this Department. The gage is of the weight-and-box type and is attached to the down-stream side of the bridge on the right-hand span. The gage is divided decimally from zero to 14 feet. The elevation of the water-surface, when the gage reads zero, equals 390.00. Standard chain length 18.72. Readings are taken at 1 P. M. each day by men from the Barge canal office at Lyons. The gage is located below the inflow of Canandaigua outlet. The down-stream side of the bridge is subdivided at 5-foot intervals for current-meter measurements, the initial point being the face of the left-hand abutment.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Clyde River at Lyons, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	396.7	393.0	391.9	393.2	393.3	392.0	391.6	391.6	391.3	391.2	391.1	392.4
2	396.8	393.2	392.8	392.8	393.0	391.8	391.5	391.7	391.2	391.1	391.0	391.9
3	395.2	393.3	394.6	392.8	392.7	391.6	391.2	391.7	391.0	391.1	391.4	391.8
4	396.5	393.4	393 6	392.6	393.3	391.8	391.3	391.7	391.3	391.3	391.7	391.4
5	396.8	392.9	392.7	392.6	393.1	391.5	391.1	391.6	391.1	391.5	391.5	391.2
6	397 6	392.8	392.5	392.6	392.8	392.0	391.4	391.6	391.2	391.1	391.3	391.5
7	396.3	392.6	392.5	392.5	392.8	391.7	391.2	391.6	391.2	391.3	392.7	391.4
8	396.9	392.4	392.4	392.4	392.7	391.6	390.9	391.4	391.2	392.1	395.2	391.3
9	397.2	392.6	392.4	392.4	392.5	391.5	391.1	391.6	391.3	392.4	395.2	391.3
10	395.6	392.5	392.4	392.4	392.4	391.4	391.2	391.4	391.4	391.7	393.6	391.8
11	395.2	392.4	392.3	392.6	392.7	391.5	391.3	391.4	391.5	391.6	393.0	392.4
12	394.6	392.0	392.7	393.2	392.7	391.5	391.2	391.3	391.2	391.4	392.4	391.9
13	394.2	392.3	393.5	393.1	392.6	391.5	391.2	391.2	391.1	391.4	392.2	391.2
14	394.1	392 4	397.5	393 0	392.5	391.5	391.5	391.6	391.1	391.4	392.0	391.7
15	395.0	392.3	397.4	392.6	392.3	391.5	391.3	391.3	391.1	391.3	391.8	391.8
16	393.6	392.5	396.9	392.5	392 6	391.4	391.1	391.3	391.0	391.3	391.8	391.7
17	393.8	392.5	397.2	392.6	392.4	391.4	391.5	391.6	391.3	391.0	391 8	391.5
18	394.0	392.4	397.4	392.5	392.3	391.1	391.2	391.5	391.0	391.1	391.3	391.7
19	393.8	392.4	396.9	392 2	392.3	390.9	391.5	391.4	391.0	391.0	391.5	391.7
20	393.9	392.2	396.0	392.3	392.2	392.2	391.4	391.0	391.2	390.9	391.6	391.4
21	394.2	392.9	395.8	392.1	392.1	391.6	391.4	391.6	391.0	391.1	391.5	391.8
22	394.4	392.6	395.2	392.0	392.0	391.1	391.4	391.4	391.1	391.1	391.7	391.9
23	395.2	392 2	395.8	391.9	391.7	391.3	391.7	391.2	391.2	391.1	391.4	392.1
24	395.2	392.4	395.8	393.4	391.8	391.0	391.6	391.3	391.4	391.0	391.2	396.3
25	394.7	392.3	395.2	394.2	391 8	390.9	391.6	391.4	391.0	391.0	391.3	397.0
26	394.5	392 3	394.3	394.3	392.1	390.9	391.4	391.3	391.1	390.9	391.2	397.2
27	394.2	392.1	394.1	394.0	392.7	390.9	391.5	391.3	391.2	391.2	392.1	395.0
28	394.0	392.2	395.2	393.6	392.3	390.8	391.2	391.2	391.0	391.4	392.5	397.1
29	393.8	......	395.1	393.3	392.1	390.9	391.7	391.3	391.1	391.2	392.5	396.5
30	393.7	......	394.0	393.3	391.9	391.3	391.5	391.6	391.7	391.1	392.4	396.9
31	393.4	......	393.6	......	391.8	......	391.3	391.4	......	391.0	......	396.4

Current-meter Discharge Measurements of Clyde River at Lyons, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
April 11	E. C. Niles	2.65	......	391	1.56	610
June 6	E. C. Niles	2.08	......	267	1.38	368
June 20	E. C. Niles	1.34	......	178	1.32	236
June 21	E. C. Niles	1.34	......	178	1.32	235
Aug. 15	E. C. Niles	1.24	......	160	0.56	*a*88.8
Sept. 25	E. C. Niles	1.25	......	157	0.85	*a*134

a Grass obstruction.

GANARGUA CREEK, NORTH OF NEWARK, N. Y.

A gaging station was established on the highway bridge 1½ miles up-stream from Newark railroad station, November 29, 1905, by James Kelly, for the Department. A box-and-chain gage, reading from zero to 13.9 feet, is attached to the down-stream side of the bridge. The elevation of water-surface, when the gage reads zero, is 406.00; chain length 15.02. Current-meter measurements were formerly made at this bridge. The bridge is located at a bend in the stream and the banks are overflowed during high water. Readings are taken about noon each day by Wm. J. Swartz. A bench-mark located on the west wing wall of Peck's highway bridge crossing the Erie Canal 1.9 miles west of Newark consists of a chiseled square, the elevation of which is 449.767.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Ganargua Creek, North of Newark, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	411.4	408.7	408.6	409.2	409.5	408.6	407.9	407.4	407.4	408.2	408.3	409.2
2	412.2	408.8	408.8	408.9	409.1	408.4	407.8	407.2	407.5	408.1	408.4	409.0
3	412.5	408.8	409.2	408.7	408.9	408.4	407.9	407.2	407.6	408.2	408.4	408.9
4	413.1	408.8	409.5	408.6	409.0	408.3	407.8	407.3	407.6	408.3	409.2	408.8
5	414.5	408.9	409.2	408.7	409.3	408.2	407.8	407.4	407.7	408.3	410.4	408.6
6	412.8	408.8	409.0	408.6	409.4	408.2	407.7	407.5	407.7	408.4	411.4	408.6
7	411.3	408.7	408.8	408.6	409.2	408.3	407.7	407.4	407.8	408.4	412.6	408.5
8	411.6	408.6	408.8	408.5	409.2	408.4	407.6	407.3	407.8	408.2	412.3	408.6
9	411.4	408.6	408.6	408.4	409.1	408.3	407.5	407.3	407.8	408.1	412.1	408.6
10	411.0	408.6	408.9	408.5	409.0	408.3	407.5	407.1	407.7	408.0	411.2	408.7
11	410.4	408.5	409.0	408.6	408.8	408.2	407.4	407.3	407.8	408.2	410.4	408.7
12	409.7	408.5	409.1	408.7	408.7	408.1	407.5	407.1	407.8	408.2	409.3	408.6
13	409.4	408.5	409.4	408.6	408.6	408.0	407.6	407.0	407.7	408.1	409.3	408.5
14	409.7	408.6	411.5	408.8	408.6	408.0	407.6	407.0	407.7	408.2	408.9	408.5
15	410.2	408.6	413.3	408.9	408.5	407.9	407.5	407.1	407.7	408.3	408.8	408.6
16	409.6	408.6	412.9	409.2	408.5	407.9	407.5	407.2	407.8	408.2	408.7	408.6
17	409.1	408.6	412.8	409.0	408.5	407.8	407.4	407.1	407.8	408.1	408.7	408.7
18	409.0	408.6	412.5	408.9	408.4	407.8	407.5	407.2	407.9	408.0	408.6	408.6
19	409.1	408.7	412.2	408.7	408.4	407.7	407.5	407.2	407.9	408.0	408.6	408.5
20	409.7	408.7	412.0	408.6	408.3	407.8	407.2	407.3	407.8	408.1	408.6	408.5
21	410.2	408.6	411.8	408.5	408.3	407.9	407.5	407.4	407.8	408.1	408.5	408.4
22	410.0	408.6	411.6	408.5	408.3	408.0	407.7	407.4	407.9	408.0	408.5	409.0
23	409.8	408.6	411.4	408.6	408.2	407.8	407.8	407.5	408.1	407.9	408.4	410.1
24	409.6	408.5	411.0	408.8	408.2	407.9	408.0	407.7	407.9	407.8	408.4	411.6
25	409.4	408.5	410.5	409.4	408.2	407.6	407.8	407.6	407.8	407.7	408.3	414.5
26	409.2	408.4	410.0	409.9	408.3	407.6	407.7	407.7	407.8	407.7	408.3	413.1
27	409.0	408.4	410.0	410.2	408.6	407.7	407.6	407.6	407.6	407.8	408.7	412.0
28	408.7	408.5	410.1	410.1	408.8	407.6	407.6	407.5	407.4	408.1	409.4	412.5
29	408.7	......	409.7	410.0	408.9	407.6	407.5	407.4	407.9	408.3	409.5	413.5
30	408.6	......	409.5	409.8	408.7	407.8	407.4	407.4	408.4	408.2	409.4	412.0
31	408.7	......	409.3	......	408.6	......	407.4	407.4	......	408.2	......	411.7

GANARGUA CREEK NEAR PALMYRA, N. Y.

A gaging station was established at Harrison's mill between Palmyra and East Palmyra for this Department in 1907. The dam is of timber and has main crest of 44.2 feet in length obstructed by two piers and in addition a wing spillway 31.1 feet in length. The elevation of the water-surface deduced from the daily reading taken above the dam is shown in the accompanying table.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Ganargua Creek near Palmyra, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	......	......	......	422.8	422.7	422.2	422.3	421.9	421.9	422.2	422.1	422.7
2	......	......	......	422.6	422.6	422.2	422.2	421.9	421.9	422.1	422.1	422.7
3	......	......	......	422.6	422.6	422.0	422.1	422.1	421.7	422.1	422.3	422.6
4	......	......	......	422.6	422.7	422.2	422.1	422.0	421.9	422.1	422.4	422.3
5	......	......	......	422.7	422.8	422.2	422.1	421.7	421.9	422.1	422.4	422.2
6	......	......	......	422.6	422.7	422.3	421.8	422.0	421.1	422.0	422.3	422.3
7	......	......	......	422.6	422.7	422.3	421.9	421.9	421.7	422.1	423.3	422.3
8	......	......	......	422.5	422.6	422.3	422.0	421.5	421.9	423.0	424.3	422.3
9	......	......	......	422.5	422.5	422.2	422.0	422.0	421.8	422.6	423.5	422.2
10	......	......	......	422.5	422.5	422.2	421.6	421.6	421.7	422.4	423.2	422.5
11	......	......	......	422.6	422.6	422.2	421.9	421.9	421.6	422.4	422.9	422.7
12	......	......	......	422.9	422.7	422.1	422.0	421.9	421.9	422.3	422.7	422.8
13	......	......	......	422.9	422.5	422.1	422.1	421.9	421.9	422.4	422.5	422.7
14	......	......	......	422.9	422.4	422.1	422.0	421.4	421.8	422.2	422.6	422.6
15	......	......	......	422.7	422.4	421.9	421.8	421.8	421.9	422.2	422.6	422.6
16	......	......	......	422.7	422.5	422.0	422.0	421.6	421.8	422.2	422.5	422.6
17	......	......	......	422.7	422.3	422.1	422.0	421.7	421.8	422.2	422.4	422.4
18	......	......	......	422.6	422.4	422.0	422.0	421.8	421.9	422.1	422.4	422.3
19	......	......	......	422.6	422.4	422.0	422.0	421.6	421.9	422.1	422.4	422.4
20	......	......	......	422.5	422.3	422.1	422.0	421.5	421.9	422.0	422.4	422.4
21	......	......	......	422.4	422.4	422.3	422.1	421.7	422.0	422.0	422.3	422.4
22	......	......	......	422.3	422.3	421.9	421.9	421.9	422.0	422.1	422.4	422.4
23	......	......	......	422.3	422.2	422.0	422.0	421.9	421.9	422.1	422.4	422.8
24	......	......	......	423.0	422.3	421.9	421.9	422.0	421.2	422.0	422.4	424.7
25	......	......	......	423.4	422.2	421.9	422.0	421.9	421.4	422.0	422.3	425.1
26	......	......	423.1	423.1	422.3	421.9	421.9	421.8	421.8	422.0	422.3	423.9
27	......	......	423.1	423.6	422.6	421.7	421.3	422.0	421.6	422.0	422.6	423.6
28	......	......	423.5	423.0	422.5	421.9	421.9	422.0	421.9	422.0	422.8	424.7
29	......	......	423.4	422.0	422.4	421.9	421.9	421.9	422.2	422.3	422.9	424.1
30	......	......	423.0	422.7	422.4	422.0	421.9	421.9	423.5	422.3	422.9	423.7
31	......	......	422.9	......	422.3	......	422.0	421.9	......	422.1	......	423.8

CANANDAIGUA OUTLET.

DESCRIPTION.

Canandaigua lake occupies one of the elongated depressions extending in nearly a north and south direction in the central lake region of New York. The drainage tributary to the lake is chiefly short lateral streams from the steep slopes of adjacent hillsides. The outflow from the lake is regulated to some extent by gates constructed by the State. The lake is at elevation about 686. From the foot of the lake at Canandaigua the outlet flows a little north to Manchester, a distance of 7 miles. In this distance a fall of 100 feet occurs, which is chiefly concentrated at several water-power dams. From Manchester the stream flows easterly 12 miles and thence northeasterly 8 miles joining Ganargua creek at Lyons to form the Clyde river. In the easterly portion of its course the stream winds with large bends through a broad sloping valley of fertile land. The fall is mostly utilized at water-power dams. The tributary drainage is moderately rolling and is interspersed with glacial kames. These are lenticular hills extending usually in a north and south direction. At Phelps, Flint creek, which is the largest tributary, enters the outlet. Flint creek drains a valley similar to the adjacent lake basins. This valley is not at present occupied by a lake, but contains an extensive swamp, reaching several miles southward from Gorham.

CANANDAIGUA OUTLET AT ALLOWAY, N. Y.

This gaging station was established September 18, 1906, by F. T. Williams for this Department. It is located at a highway bridge crossing the stream 2½ miles above Lyons. The gage has a vertical scale divided decimally and reading from zero to 11 feet. It is attached to the down-stream face of the left-hand abutment of the bridge and has its zero mark at elevation 403.45. Current-meter discharge measurements are made from the down-stream side of the bridge, which has a span of 95 feet between abutments.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Canandaigua Outlet at Alloway, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	......	......	......	405.7	406.2	404.6	404.4	404.0	403.4	403.8	403.9	404.2
2	......	......	......	405.8	406.0	404.6	404.4	404.0	403.6	403.8	403.8	404.2
3	......	......	406.2	405.8	405.6	404.6	404.4	404.0	403.4	403.8	404.2	404.2
4	......	......	406.0	405.2	405.6	404.6	404.4	404.0	403.6	403.8	404.0	404.2
5	......	......	405.6	405.2	405.4	404.6	404.4	404.0	403.6	403.8	403.9	404.2
6	......	......	405.8	405.2	405.4	404.8	404.4	404.0	403.4	403.9	403.8	404.2
7	......	......	405.4	405.0	405.4	404.6	404.4	404.0	403.4	403.8	405.0	404.1
8	......	......	405.4	405.0	405.0	404.4	404.4	404.0	403.6	403.9	405.0	404.0
9	......	......	405.2	405.0	405.0	404.4	404.4	404.0	403.6	404.2	404.7	404.0
10	......	......	405.0	405.2	405.0	404.4	404.4	403.8	403.6	404.0	404.7	404.2
11	......	......	405.2	405.2	405.0	404.4	404.4	403.8	403.6	404.0	404.4	404.4
12	......	......	405.4	405.6	405.0	404.4	404.4	403.6	403.6	403.8	404.4	404.2
13	......	......	406.2	405.4	405.0	404.4	404.4	403.6	403.6	403.8	404.4	404.4
14	......	......	409.0	405.2	405.0	404.4	404.4	403.4	403.5	403.8	404.4	404.0
15	......	......	408.0	405.2	405.0	404.4	404.4	403.4	403.4	403.9	404.2	404.0
16	......	......	406.8	405.0	405.2	404.4	404.2	403.4	403.4	403.9	404.2	404.0
17	......	......	408.7	405.2	405.2	404.4	404.2	403.4	403.4	403.8	404.2	404.2
18	......	......	408.0	405.0	405.0	404.4	404.2	403.4	403.4	404.0	404.3	404.4
19	......	......	407.0	405.	405.0	404.4	404.2	403.4	403.6	403.8	404.3	404.4
20	......	......	406.6	405	405.0	404.4	404.2	403.4	403.6	403.8	404.2	404.2
21	......	......	405.8	405	404.8	404.4	404.2	403.6	403.6	403.8	404.2	404.2
22	......	......	406.2	404.	404.8	404.4	404.4	403.6	403.6	403.8	404.2	404.3
23	......	......	406.5	405.	404.8	404.4	404.4	403.6	403.6	403.9	404.2	405.0
24	......	......	406.4	406.	404.6	404.4	404.4	403.6	403.6	403.8	404.1	407.2
25	......	......	405.8	406.	404.6	404.4	404.4	403.6	403.7	403.8	404.0	407.6
26	......	......	405.8	406.4	405.0	404.4	404.4	403.4	403.8	403.8	404.0	406.4
27	......	......	405.8	407.0	405.0	404.4	404.2	403.8	403.8	403.8	404.4	406.8
28	......	......	406.5	406.6	404.8	404.4	404.0	403.6	403.6	404.0	404.4	408.2
29	......	......	406.2	406.2	404.8	404.2	404.0	403.6	403.8	403.8	404.4	407.4
30	......	......	405.8	406.0	404.8	404.4	404.0	403.6	403.8	403.8	404.3	407.0
31	......	......	405.8		404.8	......	404.0	403.6	......	403.8	......	406.8

Current-meter Discharge Measurements of Canandaigua Outlet at Alloway, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
April 10	Niles and Davis	1.60	......	298.0	1.27	378.0
June 5	E. C. Niles	1.00	......	255.0	0.95	242.0
June 20	E. C. Niles	0.95	......	230.0	0.93	215.0
Aug. 15	E. C. Niles	0.35	......	189.0	0.41	78.0
Sept. 25	E. C. Niles	0.05	......	167.0	0.38	63.5

SKANEATELES LAKE OULET AT WILLOW GLEN, N. Y.

Skaneateles lake outlet enters Seneca river above Cross lake, crossing the Erie canal at Jordan. The fall from the foot of the lake to this point is 465 feet.

The surface of the lake has an elevation of 865 feet above tide. The valley on each side of the lake has an average width of 2.5 miles, and in this distance there is a rise of 400 to 800 feet, the greater part of it being within a mile of the lake. The inflow to the lake is through numerous short lateral feeders flowing down these slopes. The drainage areas of the lake are shown below:

*Drainage areas of Skaneateles Lake.**

	Square miles.
Land surface above State dam at Skaneateles	60.25
Water surface of lake at Skaneateles	12.75
Total drainage area above foot of lake (water surface = 17.46 per cent)	73.00
Total area above Willow Glen weir	74.25
Area above Erie canal at Jordan	93.00

The station was established March 10, 1895. It is located in the village of Willow Glen, 1.5 miles below the foot of Skaneateles lake.

Observation is made of the daily discharge over a thin-edged weir, having a crest length of 27 feet, with two end contractions. The discharge is calculated from the observed depth on a stake set with its top at crest level, 5.2 feet up-stream from the weir, by means of the Francis formula, including corrections for end contractions and velocity of approach.

Since July 1, 1894, the water-supply of the city of Syracuse has been drawn from Skaneateles lake, and the amount of this diversion should be added to the discharge over Willow Glen weir to obtain the total run-off of the drainage basin. The calculated diversion, as determined from the record of gate openings and head at the inlet gates, using the formula for orifices with a constant coefficient stated as 0.62, has been furnished by the city of

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* Areas here given have been taken from proceedings in condemnation of water-powers on Skaneateles outlet. The lake and its tributary area are shown on the Skaneateles, Tully, Cortland and Moravia topographic atlas sheets of the United States Geological Survey.

Syracuse. The observations at the weir and gates were taken by Edward Conron.

A complete description of earlier gagings of this stream is contained in the report of the State Engineer of New York, supplement for 1902, pages 61–76.

Mean Daily Discharge, Second-feet, of Skaneateles Lake Outlet at Willow Glen, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	40.5	47.5	38.3	49.9	22.5	24.3	37.4	37.3	33.1	49.1	49.1	49.1
2	42.8	47.5	38.3	49.9	22.5	24.3	37.4	39.6	56.6	49.1	49.1	46.6
3	47.5	42.8	38.3	49.9	22.5	24.3	37.4	37.4	41.9	49.1	49.1	46.6
4	47.5	40.5	38.3	14.3	22.5	24.3	35.2	37.4	33.1	51.6	49.1	49.1
5	38.3	40.5	38.3	14.3	22.5	24.3	33.1	37.4	33.1	54.1	49.1	49.1
6	57.2	40.5	38.3	14.3	22.5	26.2	33.1	37.4	33.1	54.1	49.1	49.1
7	57.2	38.3	38.3	14.3	20.7	32.0	33.1	37.4	33.1	51.6	59.1	49.1
8	57.2	38.3	38.3	14.3	20.7	28.1	33.1	37.4	33.1	61.8	54.1	49.1
9	47.5	38.3	38.3	14.3	20.7	24.3	33.1	37.4	33.1	54.1	54.1	51.6
10	47.5	38.3	38.3	8.8	22.5	24.3	33.1	37.4	33.1	49.1	51.6	54.1
11	47.5	38.3	38.3	8.8	22.5	24.3	33.1	37.4	33.1	51.6	51.6	56.6
12	47.5	38.3	38.3	6.4	20.7	24.3	33.1	37.4	33.1	51.6	51.6	54.1
13	57.2	38.3	38.3	6.4	20.7	24.3	33.1	37.4	61.8	49.1	49.1	54.1
14	57.2	38.3	38.3	6.4	20.7	24.3	33.1	37.4	61.8	49.1	49.1	56.6
15	57.2	38.3	40.5	6.4	20.7	24.3	33.1	37.4	59.1	49.1	49.1	56.6
16	52.3	38.3	40.5	6.4	20.7	24.3	33.1	37.4	59.1	49.1	49.1	54.1
17	52.3	38.3	38.3	6.4	20.7	24.3	33.1	37.4	56.6	49.1	59.1	54.1
18	52.3	38.3	38.3	6.4	20.7	24.3	33.1	37.4	54.1	49.1	59.1	49.1
19	52.3	38.3	38.3	6.4	24.3	45.1	33.1	37.4	33.1	49.1	56.6	49.1
20	52.3	38.3	40.5	6.4	24.3	45.1	33.1	37.4	91.4	49.1	51.6	49.1
21	52.3	38.3	40.5	6.4	24.3	45.1	33.1	37.4	94.4	49.1	51.6	49.1
22	52.3	38.3	40.5	4.1	24.3	45.1	33.1	37.4	94.4	49.1	51.6	49.1
23	47.5	38.3	40.5	4.1	24.3	34.0	56.6	37.4	51.6	49.1	51.6	49.1
24	47.5	38.3	42.8	11.5	24.3	32.0	61.8	37.4	51.6	49.1	51.6	59.1
25	47.5	38.3	45.1	17.4	26.2	32.0	61.8	35.2	51.6	49.1	51.6	59.1
26	47.5	38.3	47.5	14.3	28.1	32.0	56.6	35.2	51.6	49.1	51.6	56.6
27	47.5	38.3	49.9	14.3	28.1	32.0	51.6	33.1	51.6	54.1	51.6	56.6
28	47.5	38.3	52.3	6.4	26.2	32.0	51.6	33.1	51.6	54.1	51.6	59.1
29	47.5	......	52.3	4.1	26.2	32.0	51.6	33.1	54.1	49.1	46.6	7.9
30	47.5	......	52.3	2.1	26.2	32.0	51.6	33.1	51.6	49.1	49.1	59.1
31	47.5	......	52.3	......	24.3	......	51.6	33.1	......	49.1	......	54.1
Mean	49.8	39.0	41.6	13.2	23.2	29.6	39.9	33.4	50.4	50.6	51.6	48.0

Monthly Discharge of Skaneateles Lake Outlet at Willow Glen, N. Y.

[Drainage area, 74.2 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF. a	
	In outlet.	Through conduit.	Total.	Second-feet per square mile.	Depth in inches.
1906.					
December	55.6	18.5	74.1	1.00	1.15
1907.					
January	49.8	18.6	68.4	0.921	1.06
February	39.0	18.7	57.7	0.778	0.81
March	41.6	18.8	60.4	0.813	0.94
April	13.2	18.9	32.1	0.433	0.48
May	23.2	19.0	42.2	0.570	0.66
June	29.6	19.0	48.6	0.655	0.73
July	39.9	19.0	58.9	0.793	0.91
August	33.4	19.0	52.4	0.705	0.81
September	50.4	18.7	69.1	0.932	1.04
October	50.6	18.4	69.0	0.930	1.07
November	51.6	18.4	70.0	0.944	1.05
December	48.0	18.4	66.4	0.895	1.03

a Including diversion of water-supply of Syracuse.

NOTE.— The flow during February and March was probably slightly affected by ice.

CAYUGA LAKE AT ITHACA, N. Y.

A gaging station was established by E. C. Murphy at the head of Cayuga lake August 6, 1905. A staff gage is used, attached to the wall of the breakwater, about 150 feet from the light-house. Gage readings are taken once each day during the open season, and once a week during the winter by Fred Thomas. This gage is maintained by the U. S. Geological Survey in coöperation with this Department.

Elevation of Water-surface (Barge Canal Datum) of Cayuga Lake at Lighthouse near Ithaca, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1						383.52						
2		384.47	383.12								382.67	
3								383.22				
4					384.07							
5	384.62									383.07		
6				383.62			383.27					
7									383.62			382.47
8						383.27						
9		383.92	382.87								383.02	
10								383.62				
11					384.12							
12	384.92									383.02		
13				383.57			383.32					382.82
14									383.12			
15						383.07						
16		383.67	383.17								382.97	
17								383.12				
18					383.82							
19	384.62									382.97		
20				383.37			383.22					
21									383.12			382.87
22						382.92						
23		383.62	383.67								382.67	383.82
24								383.07				
25					383.62							
26	384.72									382.77		
27				384.02			382.27					
28									383.62			383.92
29			383.87			383.02						
30											382.62	
31								383.07				

NOTE.— Ice obstruction, January 19 to March 16; thickness of ice from one to five inches.

NIAGARA RIVER DRAINAGE.

GENERAL FEATURES.

Niagara river connects lakes Erie and Ontario. It receives the drainage from Tonawanda creek and adjacent smaller areas in New York.

ERIE CANAL AT CHANGE BRIDGE, PENDLETON, N. Y.

A gage was established January 30, 1905, by this Department at Change bridge crossing the Erie canal just east of the junction of the canal with Tonawanda creek at Pendleton. A vertical gage with painted division marks is attached to the piling of the left-hand side of the stream near the down-stream side of the bridge. The gage reads from 12 to 18 feet. The reading of the gage, added to 560.00, gives the elevation of water-surface. Readings are taken each afternoon by Jacob Snell, Jr.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Erie Canal at Change Bridge, Pendleton, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	573.3	570.7	570.3	570.2	571.7	571.4	571.2	571.3	571.0	571.2	571.2	371.8
2	572.2	570.9	570.7	570.0	572.1	571.6	571.2	571.4	571.3	571.2	571.3	371.6
3	572.4	571.0	571.1	569.9	571.8	571.7	571.3	571.2	571.0	571.1	571.6	371.3
4	574.5	571.0	571.3	569.5	572.3	571.3	571.4	571.3	571.0	571.8	571.6	371.0
5	574.0	570.4	571.0	569.7	572.3	571.3	571.3	571.3	571.4	571.8	571.7	371.5
6	573.3	570.7	571.7	569.2	572.1	571.4	571.3	570.9	571.2	571.9	571.6	371.1
7	572.0	570.6	570.6	569.5	571.6	571.6	571.6	571.0	571.0	571.3	572.2	371.2
8	573.4	570.3	570.8	569.8	571.8	571.7	571.4	570.6	571.1	571.9	572.3	371.2
9	573.0	570.3	570.6	569.9	571.5	571.7	571.2	570.8	571.0	572.0	572.2	371.2
10	572.9	570.7	570.8	570.0	571.6	571.3	571.0	570.9	570.9	572.0	572.2	371.0
11	571.6	570.1	570.9	569.1	571.4	571.2	571.2	571.0	571.2	571.8	571.8	370.0
12	571.2	570.0	570.8	570.0	571.8	571.5	571.6	571.0	571.0	571.8	571.6	370.0
13	571.1	570.1	571.6	570.0	571.8	571.4	571.4	571.1	571.1	572.0	571.7	370.1
14	571.0	570.4	572.8	569.1	571.6	571.6	571.8	571.0	571.2	572.8	571.7	369.9
15	571.0	570.5	572.9	569.0	571.1	571.4	571.7	570.9	571.5	571.7	571.7	370.8
16	571.2	570.8	572.7	570.0	572.1	571.6	571.6	571.2	571.1	571.6	571.7	370.8
17	571.1	570.9	573.3	570.0	571.5	571.6	571.3	571.1	570.9	572.2	571.8	371.0
18	571.0	570.9	572.5	570.0	571.7	571.5	571.2	571.0	570.9	571.0	571.6	371.0
19	571.2	570.6	572.5	570.0	571.6	571.4	571.4	571.0	571.0	571.3	571.2	371.3
20	573.5	570.6	572.5	569.9	571.5	571.4	571.5	571.0	571.3	571.5	571.1	371.2
21	571.5	570.6	572.0	570.4	571.5	571.3	571.9	571.0	571.1	571.3	571.6	371.2
22	571.2	570.6	571.6	569.5	571.6	571.4	571.9	570.9	571.2	571.5	571.6	371.0
23	571.1	570.6	571.2	570.1	571.4	571.7	571.9	570.8	571.0	571.2	571.3	371.1
24	570.8	571.1	572.2	570.7	571.2	571.6	571.9	571.0	571.2	571.3	571.1	372.0
25	570.8	571.0	571.3	571.0	571.2	571.6	571.9	571.1	571.1	571.1	571.2	373.4
26	570.9	571.0	571.1	571.7	571.8	571.5	571.4	571.0	571.0	570.9	571.4	374.5
27	570.9	570.9	573.9	571.1	572.0	571.5	571.3	571.1	570.9	571.2	571.9	375.2
28	570.7	570.8	573.5	571.7	571.8	571.4	571.9	570.9	570.8	571.3	571.9	377.2
29	570.8	......	572.5	571.4	571.6	571.1	571.6	570.9	571.0	571.4	571.8	376.4
30	570.7	......	571.0	571.0	571.4	571.3	571.5	571.0	571.4	571.2	571.7	376.4
31	570.6	......	570.9	......	571.3	......	571.4	570.9	......	571.1	......	375.0

ERIE CANAL AT MAIN STREET BRIDGE, TONAWANDA, N. Y.

Between Pendleton and Niagara river Tonawanda creek is canalized to form the Erie canal. The State dam at Tonawanda controls the water stage in this level. A gage was established at Delaware–Main street bridge, Tonawanda, January 23, 1905, by this Department. The gage is a vertical scale with painted 10th marks and is attached to the protection piling below the center pier of the bridge. The rigging of the gage, added to 560.00, gives the water-surface elevation. Readings are taken each afternoon by A. Weinholz.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Erie Canal (Main St. Bridge) at Tonawanda, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	571.4	571.0	570.8	570.3	571.9	571.9	571.5	......	......	571.6	571.5	......
2	571.7	571.1	571.5	570.3	571.8	......	571.1		570.8	571.5	571.7	571.9
3	571.8	......	......	570.0	571.9	572.0	571.7	571.45	571.0	571.4	......	571.5
4	573.0	571.2	571.3	569.3	572.3	571.9	......	......	571.0	571.9	571.7	571.0
5	572.8	571.0	570.5	569.4	......	571.8	571.8	571.6	571.1	571.8	571.6	571.5
6	......	571.1	571.5	569.4	572.3	571.7	571.6	571.2	571.1	......	571.6	571.8
7	571.5	570.9	571.6	......	571.9	571.8	......	571.1	570.9	571.6	571.8	571.5
8	572.4	570.8	571.5	569.3	571.9	571.8	571.5	570.9	......	571.8	571.9	......
9	572.2	570.8	571.6	569.3	571.9	......	571.6	571.1	571.0	571.7	571.9	571.6
10	571.8	......	......	568.8	571.9	571.8	571.5	......	570.9	571.9	......	571.5
11	571.5	570.9	571.3	568.9	571.8	571.8	571.5	......	571.5	571.8	571.7	570.3
12	571.3	570.7	571.3	568.9	......	571.7	571.7	......	571.5	571.8	571.7	570.1
13	......	570.5	571.3	568.8	571.9	571.7	571.6	......	571.5	......	571.1	570.4
14	571.4	570.8	572.0	......	571.9	571.7	......	......	571.5	571.7	571.8	570.5
15	571.2	570.8	572.0	568.3	571.4	571.7	571.9	......	......	571.7	571.8	......
16	571.2	570.7	571.9	568.3	571.6	......	571.8	......	571.6	571.6	571.6	571.0
17	571.2	......	......	568.6	571.8	571.7	571.7	571.0	571.4	571.2	......	571.5
18	571.1	570.9	571.6	568.6	571.8	571.6	571.8	......	571.3	571.4	571.6	571.5
19	571.0	570.9	571.6	568.4	......	571.8	571.6	570.9	571.4	571.6	571.6	571.4
20	......	570.8	571.5	569.0	571.8	571.8	......	571.0	571.6	......	571.1	571.5
21	571.3	570.8	571.7	......	571.7	571.7	......	570.9	571.5	571.7	571.7	570.2
22	571.1	570.7	571.4	569.7	571.6	571.7	572.0	570.9	......	571.8	571.9	......
23	571.2	570.8	571.5	570.3	571.6	......	572.0	570.9	571.5	571.7	571.8	570.7
24	571.1	......	......	570.4	571.6	571.8	572.0	570.9	571.7	571.6	......	571.6
25	571.1	570.9	571.3	570.8	571.6	571.7	572.0	......	571.6	571.5	571.7	572.4
26	571.1	570.8	571.1	571.8	......	571.8	571.6	571.3	571.4	571.4	571.8	573.3
27	......	570.7	572.6	571.6	572.6	571.7	571.5	570.9	571.3	......	571.6	574.0
28	571.2	570.7	572.5	......	571.8	572.0	......	570.9	......	571.5	571.6	573.8
29	571.2	......	571.9	571.5	571.9	571.5	571.8	570.8	......	571.4	571.9	......
30	571.1	......	572.0	571.5	571.9	......	571.8	570.9	571.3	571.5	572.0	573.8
31	571.1	......	......	......	571.9	......	571.8	570.8	......	571.6	......	573.6

NIAGARA RIVER AT TONAWANDA, N. Y.

A gage was established January 23, 1905, by this Department, near the mouth of Tonawanda creek and below the State dam. The readings of this gage, added to 560.00, show the elevation of Niagara river at its junction with Tonawanda creek. The gage is a vertical scale graduated to feet and tenths from zero to 10 feet and is attached to the protection piling at the right-hand end of the draw span of the New York Central bridge in the lumber district at Tonawanda. Readings are taken each afternoon by A. Weinholz.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Niagara River at N. Y. C. & H. R. R. R. Bridge, Tonawanda, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	567.70	566.80	567.80	567.00	567.20	567.40	567.1	......	......	567.4	567.5	560.0
2	566.60	567.10	568.60	567.10	567.20	......	567.7	......	567.5	567.4	567.6	567.0
3	567.20	569.70	......	567.10	567.30	567.50	567.4	567.7	567.3	567.6	......	566.8
4	568.30	567.00	567.80	566.90	567.50	567.50	......	......	567.5	567.8	567.7	566.2
5	567.80	566.70	567.80	567.20	......	568.60	567.5	567.5	567.6	567.6	567.7	566.9
6	......	567.20	566.80	567.20	567.20	567.90	567.6	567.8	567.6	......	567.5	566.9
7	567.20	566.90	566.90	......	567.20	567.60	......	567.7	567.6	567.7	567.8	567.1
8	567.50	567.00	566.80	567.30	567.00	567.60	568.0	567.5	......	568.1	567.8	560.0
9	567.50	566.90	566.90	567.20	567.30	......	567.7	567.4	567.7	567.9	567.9	566.7
10	568.90	......	......	567.50	567.40	567.40	567.5	......	567.4	568.2	......	566.8
11	567.50	566.90	566.80	567.50	567.40	567.40	567.6	......	568.0	567.6	567.6	567.4
12	567.00	567.10	566.50	567.30	......	567.50	567.3	......	567.6	567.7	567.7	567.0
13	......	566.90	566.50	567.20	567.50	567.40	567.5	......	567.7	......	567.9	566.4
14	567.50	567.20	567.10	......	567.50	567.60	......	......	567.8	567.6	567.8	565.1
15	567.10	567.50	567.40	567.40	567.40	567.40	567.5	......	......	567.5	567.7	560.0
16	566.40	566.40	566.80	567.80	567.50	......	567.8	......	567.8	567.5	567.6	567.6
17	567.10	......	......	567.50	567.40	566.70	567.7	567.7	567.6	567.4	......	567.1
18	567.30	566.70	566.90	567.40	567.40	567.20	567.5	......	567.4	567.5	567.7	567.2
19	567.10	567.75	567.20	567.50	......	567.20	567.5	567.5	567.6	567.6	566.8	567.4
20	572.30	566.60	566.90	567.50	567.50	567.20	567.6	567.5	567.8	......	566.7	......
21	568.00	566.70	566.80	......	567.50	567.20	......	567.4	567.7	567.5	567.5	......
22	567.60	566.90	566.90	567.60	567.50	567.20	568.0	567.4	......	567.9	567.1	560.0
23	567.40	567.20	566.90	567.60	567.30	......	567.9	567.5	567.6	567.8	567.6	565.3
24	567.50	......	......	567.50	567.10	567.20	567.9	567.7	569.0	567.6	......	566.8
25	567.60	567.00	566.80	567.10	567.10	567.50	567.8	......	568.1	567.4	566.7	567.0
26	567.50	566.50	566.90	567.60	......	568.00	567.9	567.5	567.5	567.5	568.3	567.2
27	......	567.40	567.00	567.50	569.60	567.80	567.8	567.4	567.4	......	567.1	566.8
28	568.10	567.90	567.00	......	567.70	567.80	......	567.4	......	567.4	567.1	566.9
29	568.10	......	567.20	567.20	567.60	567.60	567.9	567.4	......	567.4	567.1	560.0
30	567.50	......	567.30	567.20	567.30	......	567.9	567.5	567.7	567.5	566.5	568.2
31	567.60	......	......	......	567.00	......	567.9	567.5	......	567.5	....	568.5

HUDSON RIVER DRAINAGE BASIN.

DESCRIPTION OF BASIN.

The principal sources of Hudson river lie in the wildest portion of the Adirondack mountains, in Essex county, northeastern New York. A number of branches, any one of which might possibly be considered the main stream, form its upper waters; but if the highest collected and permanent body of water be assumed as the true head, then the source of the Hudson becomes Lake Tear-of-the-Clouds, which lies at an elevation of 4,322 feet above tide, in the center of the triangle formed by Mounts Marcy and Skylight and Gray Peak.

The river flows rather irregularly southward until it reaches the northern boundary of Saratoga county, when it makes a sharp turn and flows eastward for about 12 miles by general course, passing through the mountains and forming, as it cuts across the rocky strata, several notable waterfalls. At Sandy Hill, just below Glens Falls, it makes another abrupt turn and flows southward, continuing in this direction until it empties into New York bay.

From Lake Tear-of-the-Clouds to the mouth of the river the distance by water is probably about 300 miles. The total area drained is 13,366 square miles. The river is tidal to Troy, which is also at the head of navigation.

The tributaries of the Hudson are numerous, and many of them are large and important. Indian river, Schroon river, and Sacandaga unite with the main stream above Glens Falls, and between the latter point and Troy Hudson river receives Batten kill, Fish creek, Hoosic river and the Mohawk. The tributaries below Troy include Catskill, Esopus and Rondout creeks and Wallkill river from the west, and Kinderhook creek, Jansen kill, Wappinger creek, Fishkill creek and Croton river from the east.

LOWER HUDSON RIVER DRAINAGE BASIN.

DESCRIPTION.

Below Troy the bed of Hudson river is depressed below tidewater level. The stage of the stream is controlled by tidal action, by the inflow of the main stream and by the lateral drainage jointly. The drainage tributary to this portion of the stream includes the south and east slopes of the Catskill mountain region on the west bank and a series of streams heading near the New York–Massachusetts and the New York–Connecticut lines on the east. These streams include the principal present and proposed sources of municipal water-supply of New York city.

KINDERHOOK CREEK AT ROSSMAN, N. Y.

A gaging station was established at Rossman highway bridge on Kinderhook creek, March 17, 1906, by Robert E. Horton. This gaging station is maintained by the U. S. Geological Survey in coöperation with this Department. The gage is of the weight-tape-and-reel pattern, and readings are taken morning, noon and evening by Wesley Ham.

The channel is rock, and is nearly straight for some distance above and below the gage.

The station is about one-quarter mile below a dam, and very little ice obstruction occurs except in extreme cold weather.

A description of Kinderhook creek, with the results of gagings made in 1892–1894, may be found in the report of the State Engineer and Surveyor for 1902, Supplement, pages 252–256.

Mean Daily Gage Height, in Feet, of Kinderhook Creek at Rossman, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	29.37	27.87	26.93	28.22	27.62	27.35	a	26.58	26.27	28.27	29.45	27.57
2	29.50	27.87	26.83	27.93	27.62	27.70	a	26.65	26.32	27.57	29.22	27.48
3	28.33	27.62	26.88	27.87	27.52	28.37	a	26.57	26.30	27.60	30.72	27.42
4	27.97	27.53	26.88	27.78	27.50	28.72	a	26.58	27.53	27.10	28.73	27.37
5	28.92	27.32	27.07	27.67	27.68	28.18	a	26.58	27.73	27.30	28.57	27.28
6	28.82	27.15	27.12	27.67	27.62	28.42	a	26.58	27.32	27.63	28.27	27.28
7	28.72	27.05	27.13	27.47	27.62	28.45	a	26.58	26.97	27.83	31.47	27.28
8	28.73	27.25	27.12	27.45	27.63	28.24	a	26.57	26.92	27.80	30.25	27.27
9	28.55	27.13	27.07	27.48	27.72	28.10	a	26.60	26.88	28.37	29.75	27.18
10	28.03	27.13	26.98	27.48	27.60	27.78	26.58	26.60	26.90	27.92	29.23	28.98
11	28.27	27.28	26.98	27.63	27.52	27.72	26.68	26.58	27.40	28.02	28.48	29.85
12	28.08	27.38	26.88	27.92	27.48	27.62	26.70	26.52	27.38	28.60	28.47	28.93
13	27.92	27.48	26.93	28.13	27.43	27.50	27.38	26.47	27.42	28.92	28.30	28.70
14	27.82	27.28	27.28	28.37	27.37	27.45	26.85	26.43	27.32	27.97	28.10	28.48
15	27.62	27.23	28.65	28.50	27.33	27.37	26.85	26.42	27.07	27.85	28.05	28.27
16	27.53	27.15	28.55	28.23	27.50	27.17	26.85	26.33	26.95	27.73	27.90	28.17
17	27.57	27.27	28.30	28.20	28.85	27.08	26.87	26.37	26.87	27.70	27.87	27.90
18	27.52	27.30	28.23	28.03	28.33	26.97	27.25	26.38	26.88	27.58	27.82	27.88
19	27.62	27.28	28.32	27.95	28.13	26.88	27.17	26.37	26.87	27.48	27.82	27.83
20	28.42	27.17	28.07	27.95	28.05	26.83	27.12	26.32	26.77	27.38	27.78	27.80
21	28.00	27.12	27.70	27.87	27.83	26.90	27.22	26.35	26.72	27.68	27.72	27.73
22	27.83	27.12	27.77	27.77	27.67	26.90	27.02	26.28	26.73	27.53	27.68	27.72
23	27.58	26.97	28.10	27.58	27.53	26.88	26.92	26.27	26.82	27.43	27.62	27.85
24	27.72	26.87	28.73	27.70	27.38	26.85	26.77	26.25	28.68	27.33	27.52	28.68
25	27.90	26.83	28.25	28.15	27.32	26.88	26.75	26.27	27.83	27.18	27.48	29.00
26	27.88	26.98	28.18	27.93	27.43	26.90	26.77	26.25	27.47	26.98	27.48	28.30
27	27.97	27.12	28.13	27.78	27.60	26.85	26.73	26.27	27.42	27.03	27.53	28.30
28	28.02	27.18	28.35	27.80	27.52	26.87	26.73	26.27	27.33	29.17	27.52	28.32
29	28.08	......	28.97	27.75	27.43	26.87	26.72	26.25	27.82	34.07	27.57	28.32
30	27.92	.....	28.85	27.70	27.32	26.92	26.68	26.25	28.65	32.00	27.60	28.32
31	27.87	.....	28.45	......	27.32	......	26.60	26.27	......	30.07	......	28.67

a No record.

Current-meter Discharge Measurements, Kinderhook Creek at Rossman, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square Feet.*	*Feet per second.*	*Second-feet.*
1907.						
Mar. 16 *a*	E. F. Weeks	28.63	154	410	3.35	1,370
Mar. 19 *a*	E. F. Weeks	28.37	151	362	3.15	1,140
June 22 *b*	Wood and Hoyt	26.90	138	117	1.62	190
Sept. 6 *b*	W. G. Hoyt	27.32	138	195	2.02	394
Dec. 23 *b*	D. M. Wood	27.88	148	265	2.68	708

a Up-stream side of bridge.
b Down-stream side of bridge.

Rating table for Kinderhook Creek at Rossman, N. Y., from March 16, 1906 to December 31, 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
		27.00	223	28.00	821	29.00	1,640	30.00	2,460	31.00	3,280
		27.10	262	28.10	902	.....	......	.....	......	.....	......
		27.20	305	28.20	984	.....	......	.....	......	.....	......
26.30	47	27.30	353	28.30	1,066	.....	......	.....	......	.....	......
26.40	64	27.40	406	28.40	1,148	.....	......	.....	......	.....	......
26.50	84	27.50	461	28.50	1,230	.....	......	.....	......	.....	......
26.60	107	27.60	527	28.60	1,312	.....	......	.....	......	.....	......
26.70	132	27.70	594	28.70	1,394	.....	......	.....	......	.....	......
26.80	159	27.80	665	28.80	1,476	.....	......	.....	......	.....	......
26.90	189	27.90	741	28.90	1,558	.....	......	.....	......	.....	......

The above table is applicable only for open conditions. It is based upon 11 discharge measurements made during 1906–07. It is well defined between gage heights 26.6 feet and 28.5 feet. The table has been extended beyond these limits. Above gage height 28.1 the rating curve is a tangent, the difference being 82 per tenth.

Mean Daily Discharge, Second-feet, of Kinderhook Creek at Rossman, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
1	.....	.....	.....	1,020	544	560	480	242	146	139	329	353
2	.....	.....	.....	902	420	511	527	242	126	139	341	317
3	.....	.....	.....	781	612	393	560	223	120	132	317	294
4	.....	.....	.....	722	511	341	464	214	132	146	242	273
5	.....	.....	.....	902	544	329	480	223	159	139	198	262
6	.....	.....	.....	1,210	480	1,070	393	198	139	113	206	233
7	.....	.....	.....	1,130	464	984	305	366	139	120	206	722
8	.....	.....	.....	902	450	703	252	353	120	84	198	647
9	.....	.....	.....	902	450	630	242	366	95.5	120	198	612
10	.....	.....	.....	1,500	984	527	233	198	132	120	166	577
11	.....	.....	.....	2,130	630	647	214	214	139	132	152	560
12	.....	.....	.....	1,780	527	527	174	166	126	139	353	450
13	.....	.....	.....	1,540	511	450	146	152	107	198	366	420
14	.....	.....	.....	1,250	464	317	146	146	84	166	341	450
15	.....	.....	.....	2,460	406	317	166	152	84	166	305	420
16	.....	.....	.....	2,970	366	317	132	139	74	166	329	406
17	.....	.....	393	2,110	353	341	132	139	107	132	305	406
18	.....	.....	366	1,640	420	341	139	132	89.8	139	291	420
19	.....	.....	353	1,270	393	305	166	146	84	132	1,150	252
20	.....	.....	353	1,150	317	284	146	84	89.8	305	1,020	214
21	.....	.....	341	984	329	223	139	101	84	862	943	198
22	.....	.....	341	902	329	284	84	101	89.8	665	902	262
23	.....	.....	273	862	329	206	152	101	89.8	496	761	305
24	.....	.....	233	931	329	126	132	101	132	380	647	233
25	.....	.....	223	821	262	174	139	107	146	380	527	273
26	.....	.....	273	722	252	189	152	132	139	366	450	242
27	.....	.....	1,600	612	159	159	139	107	113	366	406	242
28	.....	.....	2,460	594	1,150	159	126	159	126	305	420	242
29	.....	.....	1,580	480	1,520	139	120	159	132	262	420	273
30	.....	.....	1,270	496	1,070	139	139	159	84	317	380	273
31	.....	.....	1,290	.....	761	.....	174	159	.....	341	.....	1,020
Mean	.....	.....	757	1,190	527	390	226	177	114	247	429	402

Mean Daily Discharge, Second-feet, of Kinderhook Creek at Rossman, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	*a*	*a*	*a*	1,000	544	380	*b*	101	43.1	1,050	2,010	511
2	*a*	*a*	*a*	761	544	594	*b*	120	51.2	511	1,820	450
3	*a*	*a*	*a*	722	480	1,130	*b*	101	47	527	3,050	420
4	*a*	*a*	*a*	647	464	1,410	*b*	101	480	262	1,410	393
5	*a*	*a*	*a*	577	577	964	*b*	101	612	353	1,290	341
6	*a*	*a*	*a*	544	544	1,170	*b*	101	366	544	1,050	341
7	*a*	*a*	*a*	450	544	1,190	*b*	101	214	684	3,670	341
8	*a*	*a*	*a*	435	544	1,070	*b*	101	198	665	2,660	341
9	*a*	*a*	*a*	450	612	902	*b*	107	182	1,130	2,260	294
10	*a*	*a*	*a*	450	527	647	101	107	189	761	1,820	1,620
11	*a*	*a*	*a*	544	480	612	126	101	406	841	1,210	2,340
12	*a*	*a*	*a*	761	450	544	132	89.8	393	1,310	1,210	1,580
13	*a*	*a*	*a*	922	420	464	393	79	420	1,580	1,070	1,390
14	*a*	*a*	*a*	1,130	393	435	174	69	366	801	902	1,210
15	*a*	*a*	*a*	1,230	366	393	174	69	252	703	862	1,050
16	*a*	*a*	*a*	1,000	464	294	174	51.2	206	612	741	964
17	*a*	*a*	1,070	984	1,520	252	182	59.8	182	594	722	741
18	*a*	*a*	1,000	841	1,090	214	329	59.8	182	511	684	722
19	*a*	*a*	1,090	781	922	182	294	59.8	166	450	684	684
20	*a*	*a*	882	781	862	163	273	51.2	152	393	647	665
21	*a*	*a*	594	722	684	189	317	55.5	139	577	612	612
22	*a*	*a*	647	647	577	189	233	43.1	139	480	577	612
23	*a*	*a*	902	511	480	182	198	43.1	166	420	544	703
24	*a*	*a*	1,410	594	393	174	152	39.2	1,370	366	480	1,370
25	*a*	*a*	1,020	943	366	182	146	43.1	684	294	450	1,640
26	*a*	*a*	964	761	420	189	152	39.2	450	214	450	1,070
27	*a*	*a*	922	647	527	174	139	43.1	420	233	480	1,070
28	*a*	*a*	1,110	665	480	182	139	43.1	366	1,780	480	1,090
29	*a*	*a*	1,620	630	420	182	139	39.2	684	5,800	511	1,090
30	*a*	*a*	1,520	594	366	198	126	39.2	1,350	4,100	527	1,090
31	*a*	*a*	1,190	......	366	......	107	43.1	....	2,500	......	1,370
Mean	*a*	*a*	1,060	724	562	495	191	71	362	1,000	1,160	907

a Ice obstruction. *b* No record.

Monthly Discharge of Kinderhook Creek at Rossman, N. Y.

[Drainage area, 331 square miles.]

MONTH.	Discharge in Second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1906.					
March (15 days)	2,460	223	757	2.29	2.63
April	2,970	480	1,190	3.59	4.02
May	1,520	159	527	1.59	1.83
June	1,070	126	390	1.18	1.32
July	560	84	226	0.682	0.784
August	366	84	177	0.534	0.614
September	159	74	114	0.344	0.385
October	862	84	247	0.746	0.858
November	1,150	152	429	1.30	1.46
December	1,620	198	402	1.21	1.39

Monthly Discharge of Kinderhook Creek at Rossman, N. Y.

[Drainage area, 331 square miles.]

MONTH.	Discharge in Second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
March (15 days)	1,620	594	1,060	3.20	3.68
April	1,230	435	724	2.19	2.45
May	1,520	366	562	1.70	1.96
June	1,410	163	495	1.49	1.67
July (22 days)	393	101	191	0.577	0.664
August	120	39.2	71	0.214	0.246
September	1,370	43.1	362	1.09	1.22
October	5,800	214	1,000	3.02	3.47
November	3,670	450	116	3.50	3.92
December	2,340	294	907	2.74	3.15

CATSKILL CREEK AT SOUTH CAIRO, N. Y.

The basin of this stream receives the run-off from the north slope of the Catskill range and lies, for the most part, in the timbered highlands of Greene county. The slopes are precipitous, there are no lakes, and the amount of artificial storage is small. The underlying rock formation is chiefly Devonian shale. The topography of the area is shown on the Durham, Coxsackie and Catskill sheets of the United States Geological Survey topographic atlas. The stream flows over a rock bed through much of its course and enters tide-water of Hudson river at Catskill.

The gaging station was established July 4, 1901, by Robert E. Horton and George B. Hollister, and is located at the highway bridge in the village of South Cairo. It is maintained by the U. S. Geological Survey in coöperation with this Department.

The stream channel is rock, covered in some places with earth. The bridge has a single span of 194.5 feet between abutments.

The stage of the stream is observed each morning and night from a standard chain gage, which is attached to the bridge and the elevation of which is referred to a circle near the outer corner on the up-stream side of the bridge-seat on the right-hand abutment. The elevation of the bench-mark is 21.29 feet above gage datum.

The erection of a dam a short distance below the gage for purposes of boating necessitated withholding a portion of the record for 1904. This dam was removed in the spring of 1905, and the discharge for 1906–1907 has been calculated from the rating table as formerly used.

Mean Daily Gage Height, in Feet, of Catskill Creek at South Cairo, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	5.0	3.0	2.6	4.08	3.85	2.9	......	......	......	......	......	......
2	3.8	2.9	2.5	3.65	3.65	3.15	......	......	......	......	......	......
3	3.4	2.8	2.6	3.5	3.5	3.85	......	......	......	......	......	......
4	4.28	2.8	2.6	3.38	3.7	3.6	......	......	......	......	......	......
5	3.65	2.9	2.5	3.4	3.65	3.8	......	......	......	......	......	......
6	3.3	2.7	2.47	3.2	3.5	3.45	......	......	......	......	......	......
7	3.4	2.8	2.6	3.0	3.5	3.28	......	......	......	......	......	......
8	4.6	3.05	2.6	3.15	4.0	3.0	......	......	......	......	......	......
9	4.25	2.7	2.5	3.2	3.7	3.0	......	......	......	......	......	......
10	3.25	2.4	2.5	3.25	3.5	2.85	......	......	......	......	......	......
11	3.5	2.9	2.55	3.25	3.4	2.75	......	......	......	......	......	......
12	3.22	3.0	2.5	3.92	3.32	2.6	......	......	......	......	......	......
13	3.1	2.78	2.5	4.2	3.2	2.6	......	......	......	......	......	......
14	3.0	2.9	2.6	4.68	3.1	2.55	......	......	......	......	......	......
15	3.4	2.5	5.0	4.45	3.0	2.5	......	......	......	......	......	......
16	3.39	2.7	4.8	4.15	2.9	2.5	......	......	......	......	......	......
17	3.38	2.8	4.4	4.24	2.95	2.38	......	......	......	......	......	......
18	3.4	2.9	4.65	3.95	3.15	2.25	......	......	......	......	......	......
19	3.52	2.8	3.95	3.8	3.15	2.1	......	......	......	......	......	......
20	6.8	2.92	3.7	3.75	3.02	2.1	......	......	......	......	......	......
21	4.7	2.8	3.15	3.5	2.95	2.4	......	......	......	......	......	......
22	3.1	2.7	3.5	3.48	2.75	2.25	......	......	......	......	......	......
23	3.35	2.85	4.72	3.9	2.65	2.1	......	......	......	......	......	......
24	3.4	2.7	4.8	5.0	2.55	2.02	......	......	......	......	......	......
25	3.2	2.7	4.28	4.75	2.5	2.0	......	......	......	......	......	......
26	3.1	2.7	4.3	4.2	2.78	2.1	......	......	......	......	......	......
27	3.0	2.45	4.4	4.3	3.12	2.4	......	......	......	......	......	......
28	3.15	2.6	4.85	3.98	3.65	2.4	......	......	......	......	......	......
29	3.1	......	5.1	3.85	3.28	2.4	......	......	......	......	......	......
30	3.05	......	5.08	3.7	3.15	2.4	......	......	......	......	......	......
31	3.0	......	4.3	......	2.95	......	......	......	......	......	......	......

NOTE.— River frozen, January 17 to March 14; thickness of ice varying from 2 to 14 inches.

ESOPUS CREEK AT KINGSTON, N. Y.

A gaging station was established July 5, 1901, by Robert E. Horton, at the Washington street bridge over Esopus creek at Kingston. This station is maintained by the U. S. Geological Survey in coöperation with this Department.

The channel is straight at the point of gaging, but curves a short distance above and below. The right bank is subject to overflow during high water, but at ordinary and low stages the flow is all confined in one channel.

A standard chain gage is attached to the bridge; length of chain, 31.04 feet. The gage is read twice each day by John Douglas. The bench-mark is a cut on the up-stream corner of the right-hand abutment; elevation, 31.73 feet above the datum of the gage.

In winter and at times when the stream was more or less obstructed by ice, special discharge measurements have been made, from which a rating curve, applicable to periods when the stream is frozen, has been derived. This gives a discharge considerably smaller at a given stage of the stream than is indicated by a regular rating curve for the cross-section derived from measurements in open section.

Mean Daily Gage Height, in Feet, of Esopus Creek at Kingston, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	11.45	7.55	5.20	7.85	6.35	.....	.....	.....	.....	.....	.....	.....
2	9.15	7.95	5.20	7.00	6.20	.....	.....	.....	.....	.....	.....	.....
3	8.25	8.05	5.25	6.70	6.00	.....	.....	.....	.....	.....	.....	.....
4	8.35	7.15	5.40	6.45	6.80	.....	.....	.....	.....	.....	.....	.....
5	8 10	6.70	5.30	6.40	.....	.....	.....	.....	.....	.....	.....	.....
6	7.75	6.20	5.20	6.30	.....	.....	.....	.....	.....	.....	.....	.....
7	7.35	6.15	5.15	5.95	.....	.....	.....	.....	.....	.....	.....	.....
8	7.75	6.25	5.10	6.00	.....	.....	.....	.....	.....	.....	.....	.....
9	7.95	6.20	5.15	6.05	.....	.....	.....	.....	.....	.....	.....	.....
10	7 40	6.20	5.10	6.05	.....	.....	.....	.....	.....	.....	.....	.....
11	7.25	6.15	5.00	5.95	.....	.....	.....	.....	.....	.....	.....	.....
12	7.00	5.95	4.95	6.50	.....	.....	.....	.....	.....	.....	.....	.....
13	6.90	5.70	5.10	6.50	.....	.....	.....	.....	.....	.....	.....	.....
14	6.60	5.65	5.80	6.50	.....	.....	.....	.....	.....	.....	.....	.....
15	6.85	6.10	9.20	6.40	.....	.....	.....	.....	.....	.....	.....	.....
16	6.40	6.05	8.75	6.20	.....	.....	.....	.....	.....	.....	.....	.....
17	7.15	5.80	8.45	6.15	.....	.....	.....	.....	.....	.....	.....	.....
18	7.15	5.60	9.10	6.00	.....	.....	.....	.....	.....	.....	.....	.....
19	7.25	5.60	8.15	5.75	.....	.....	.....	.....	.....	.....	.....	.....
20	8.45	5.50	7.90	5.80	.....	.....	.....	.....	.....	.....	.....	.....
21	11.30	5.45	7.50	5.65	.....	.....	.....	.....	.....	.....	.....	.....
22	10.10	5.25	8 10	5.60	.....	.....	.....	.....	.....	.....	.....	.....
23	9.65	5.10	8.90	5 60	.....	.....	.....	.....	.....	.....	.....	.....
24	8.90	5.10	9.60	6.50	.....	.....	.....	.....	.....	.....	.....	.....
25	9.00	5.10	8.85	7.45	.....	.....	.....	.....	.....	.....	.....	.....
26	8 95	5.40	8.20	7.20	.....	.....	.....	.....	.....	.....	.....	.....
27	8.60	5.50	7.80	7.10	.....	.....	.....	.....	.....	.....	.....	.....
28	8.45	5.40	7.85	6.75	.....	.....	.....	.....	.....	.....	.....	.....
29	8.30	.....	9.00	6.65	.....	.....	.....	.....	.....	.....	.....	.....
30	8.05	.....	8.75	6.40	.....	.....	.....	.....	.....	.....	.....	.....
31	7.65	.....	7.90	.....	.....	.....	.....	.....	.....	.....	.....	.....

Current-meter Discharge Measurements of Esopus Creek at Kingston, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
Feb. 18 *a*	Covert and Wood	5.68	95	282	0.71	200
Feb. 19 *b*	Covert and Wood	5.45	93	258	0.69	179

a Gage height to top of ice, 5.68; gage height to bottom of ice, 5.03.
b Gage height to top of ice, 5.61; gage height to bottom of ice, 4.96.

Rating table for Esopus Creek at Kingston, N. Y., from July 5, 1901, to December 31, 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
3.50	8	4.70	200	5.90	498	8.00	1,373
3.60	22	4.80	220	6.00	527	8.50	1,640
3.70	36	4.90	240	6.20	596	9.00	1,940
3.80	49	5.00	260	6.40	665	9.50	2,275
3.90	63	5.10	285	6.60	741	10.00	2,642
4.00	77	5.20	309	6.80	823	10.50	3,030
4.10	94	5.30	334	7.00	905	11.00	3,440
4.20	110	5.40	358	7.20	995	12.00	4,340
4.30	127	5.50	383	7.40	1,085	13.00	5,305
4.40	143	5.60	412	7.60	1,179	14.00	6,280
4.50	160	5.70	441	7.80	1,276	15.00	7,310
4.60	180	5.80	469	......	....	16.00	8,390

The above table is applicable only for open-channel conditions. It is based on discharge measurements made during 1901–6. It is well defined between gage heights 3.8 feet and 11 feet. The table has been extended beyond these limits, being based on two measurements above 11 feet.

Mean Daily Discharge, Second-feet, of Esopus Creek at Kingston, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	*a*	*a*	*a*	1,060	......	......	......	......	......	......	......	......
2	*a*	*a*	*a*	905	......	......	......	......	......	......	......	......
3	*a*	*a*	*a*	782	......	......	......	......	......	......	......	......
4	*a*	*a*	*a*	682	......	......	......	......	......	......	......	......
5	*a*	*a*	*a*	665	......	......	......	......	......	......	......	......
6	*a*	*a*	*a*	631	......	......	......	......	......	......	......	......
7	*a*	*a*	*a*	512	......	......	......	......	......	......	......	......
8	*a*	*a*	*a*	527	......	......	......	......	......	......	......	......
9	*a*	*a*	*a*	544	......	......	......	......	......	......	......	......
10	*a*	*a*	*a*	544	......	......	......	......	......	......	......	......
11	*a*	*a*	*a*	512	......	......	......	......	......	......	......	......
12	*a*	*a*	*a*	700	......	......	......	......	......	......	......	......
13	*a*	*a*	*a*	700	......	......	......	......	......	......	......	......
14	*a*	*a*	*a*	700	......	......	......	......	......	......	......	......
15	*a*	*a*	*a*	665	......	......	......	......	......	......	......	......
16	*a*	*a*	*a*	596	......	......	......	......	......	......	......	......
17	*a*	*a*	*a*	579	......	......	......	......	......	......	......	......
18	*a*	*a*	2,010	527	......	......	......	......	......	......	......	......
19	*a*	*a*	1,450	455	......	......	......	......	......	......	......	......
20	*a*	*a*	1,320	469	......	......	......	......	......	......	......	......
21	*a*	*a*	1,130	426	......	......	......	......	......	......	......	......
22	*a*	*a*	1,430	412	......	......	......	......	......	......	......	......
23	*a*	*a*	1,820	412	......	......	......	......	......	......	......	......
24	*a*	*a*	2,350	700	......	......	......	......	......	......	......	......
25	*a*	*a*	1,850	1,110	......	......	......	......	......	......	......	......
26	*a*	*a*	1,480	995	......	......	......	......	......	......	......	......
27	*a*	*a*	1,280	930	......	......	......	......	......	......	......	......
28	*a*	*a*	1,300	802	......	......	......	......	......	......	......	......
29	*a*	......	1,910	762	......	......	......	......	......	......	......	......
30	*a*	......	1,790	665	......	......	......	......	......	......	......	......
31	*a*	......	1,320	......	......	......	......	......	......	......	......	......
Mean	......	......	1,600	666	......	......	......	......	......	......	......	......

a Ice obstruction.

Monthly Discharge of Esopus Creek at Kingston, N. Y.
[Drainage area, 324 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
March (14 days)	2,350	1,130	1,600	4.94	5.68
April	1,110	412	666	2.06	2.31

RONDOUT CREEK AT ROSENDALE, N. Y.

This station was established by Robert E. Horton, July 6, 1901, at the highway bridge at Rosendale, discontinued November 7, 1903, and reëstablished in December, 1905, in coöperation with the New York water-supply commission.

The Delaware and Hudson canal, now abandoned above High Falls, draws its water-supply for the section from High Falls to Eddyville from Rondout creek at the feeder dam above Rosendale. The flow in the canal is, therefore, to be added to that at the gaging station to obtain the total run-off from the drainage area above this point.

The bed of the channel at the gaging station is composed of rock. The entire discharge, with the exception of the diversion into the canal, passes under the highway bridge at all stages.

Discharge measurements are made from the bridge, except at low water, when they are made by wading at a ford 1 mile downstream. The bridge has a single span of 136 feet.

Gage readings are made twice each day by Anna E. Huben, by means of a chain gage supported by outriggers fastened to the floor-beams near the center of the down-stream side of the bridge. The bench-mark is a circle cut in the up-stream corner of the bridge-seat on the right-hand abutment.

Mean Daily Gage Height, in Feet, of Rondout Creek at Rosendale, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	11.05	8.80	7.60	8.00	6.90	......	......	......	......	......	......	......
2	9.30	8.70	7.60	7.70	6.85	......	......	......	......	......	......	......
3	8.05	8.60	7.65	7.10	6.80	......	......	......	......	......	......	......
4	8.00	8.65	7.60	7.10	6.90	......	......	......	......	......	......	......
5	8.10	8.60	7.60	7.00	......	......	......	......	......	......	......	......
6	7.80	8.65	7.50	6.95	......	......	......	......	......	......	......	......
7	7.50	8.70	7.55	......	......	......	......	......	......	......	......	......
8	8.00	8.60	7.50	......	......	......	......	......	......	......	......	......
9	8.20	8.55	7.50	......	......	......	......	......	......	......	......	......
10	7.80	8.45	7.70	......	......	......	......	......	......	......	......	......
11	7.60	8.30	7.65	......	......	......	......	......	......	......	......	......
12	7.70	8.20	7.70	......	......	......	......	......	......	......	......	......
13	7.50	8.15	7.80	......	......	......	......	......	......	......	......	......
14	7.30	8.15	7.90	7.30	......	......	......	......	......	......	......	......
15	7.20	8.20	9.20	7.10	......	......	......	......	......	......	......	......
16	7.50	8.20	14.50	8.10	......	......	......	......	......	......	......	......
17	7.40	8.20	13.90	7.20	......	......	......	......	......	......	......	......
18	7.35	8.20	12.30	7.10	......	......	......	......	......	......	......	......
19	7.75	8.10	10.10	7.05	......	......	......	......	......	......	......	......
20	9.10	7.90	9.65	7.00	......	......	......	......	......	......	......	......
21	9.60	7.85	9.30	6.95	......	......	......	......	......	......	......	......
22	8.40	7.85	8.60	6.85	......	......	......	......	......	......	......	......
23	7.80	7.80	10.15	6.90	......	......	......	......	......	......	......	......
24	7.70	7.85	10.95	7.35	......	......	......	......	......	......	......	......
25	7.85	7.80	9.70	7.95	......	......	......	......	......	......	......	......
26	8.00	7.80	8.65	7.30	......	......	......	......	......	......	......	......
27	8.40	7.75	8.35	7.25	......	......	......	......	......	......	......	......
28	9.10	7.65	8.00	7.10	......	......	......	......	......	......	......	......
29	9.00	......	10.10	7.00	......	......	......	......	......	......	......	......
30	8.90	......	9.20	6.95	......	......	......	......	......	......	......	......
31	8.85	......	8.90	......	......	......	......	......	......	......	......	......

Mean Daily Discharge, Second-feet, of Rondout Creek at Rosendale, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	*a*	*a*	*a*	1,470	......	......	......	......	......	......	......	......
2	*a*	*a*	*a*	1,170	......	......	......	......	......	......	......	......
3	*a*	*a*	*a*	626	......	......	......	......	......	......	......	......
4	*a*	*a*	*a*	626	......	......	......	......	......	......	......	......
5	*a*	*a*	*a*	540	......	......	......	......	......	......	......	......
6	*a*	*a*	*a*	509	......	......	......	......	......	......	......	......
7	*a*	*a*	*a*	*b*	......	......	......	......	......	......	......	......
8	*a*	*a*	*a*	*b*	......	......	......	......	......	......	......	......
9	*a*	*a*	*a*	*b*	......	......	......	......	......	......	......	......
10	*a*	*a*	*a*	*b*	......	......	......	......	......	......	......	......
11	*a*	*a*	*a*	*b*	......	......	......	......	......	......	......	......
12	*a*	*a*	*a*	*b*	......	......	......	......	......	......	......	......
13	*a*	*a*	*a*	*b*	......	......	......	......	......	......	......	......
14	*a*	*a*	*a*	799	......	......	......	......	......	......	......	......
15	*a*	*a*	*a*	626	......	......	......	......	......	......	......	......
16	*a*	*a*	*a*	1,580	......	......	......	......	......	......	......	......
17	*a*	*a*	*a*	712	......	......	......	......	......	......	......	......
18	*a*	*a*	6,670	626	......	......	......	......	......	......	......	......
19	*a*	*a*	3,820	583	......	......	......	......	......	......	......	......
20	*a*	*a*	3,290	540	......	......	......	......	......	......	......	......
21	*a*	*a*	2,870	478	......	......	......	......	......	......	......	......
22	*a*	*a*	2,110	446	......	......	......	......	......	......	......	......
23	*a*	*a*	3,880	478	......	......	......	......	......	......	......	......
24	*a*	*a*	4,860	842	......	......	......	......	......	......	......	......
25	*a*	*a*	3,340	1,370	......	......	......	......	......	......	......	......
26	*a*	*a*	2,160	799	......	......	......	......	......	......	......	......
27	*a*	*a*	1,840	756	......	......	......	......	......	......	......	......
28	*a*	*a*	1,470	626	......	......	......	......	......	......	......	......
29	*a*	......	3,820	540	......	......	......	......	......	......	......	......
30	*a*	......	2,760	509	......	......	......	......	......	......	......	......
31	*a*	......	2,430	......	......	......	......	......	......	......	......	......
Mean	......	......	3,240	750	......	......	......	......	......	......	......	......

a Ice obstruction.
b No record.

Monthly Discharge of Rondout Creek at Rosendale, N. Y.
[Drainage area, 380 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
March (14 days)........	6,670	1,470	3,240	....	....
April (23 days).........	1,580	446	750	....	....

MOHAWK RIVER DRAINAGE BASIN.

DESCRIPTION.

Mohawk river, the largest of the tributaries of the Hudson river, rises in the sandy hills south of Boonville, in western New York, about 40 miles from the east end of Lake Ontario. Its uppermost tributaries are fed by large springs, and in addition the stream receives considerable water brought in from the adjacent Black river drainage basin for the supply of the Black River and Erie canals.

The Mohawk flows southward until it reaches the city of Rome, at which point it turns to the east, flowing across the state in a course a little south of east until it enters the Hudson at Cohoes, a few miles above Troy. It has a length by actual course of 140 to 145 miles, and a drainage area, measured at the mouth, of about 3,468 square miles.

The immediate valley of the Mohawk is broad and open, at many places a mile or two in width, from which there is a rise, usually gradual but sometimes abrupt, to hills which attain altitudes several hundred feet above the stream. Toward the mouth of the river the valley becomes more contracted and the meadows disappear. The flats which border the stream have a rich alluvial soil; the more elevated lands are covered with gravelly loam and clay.

Above Rome the Mohawk flows through a deep gorge in shale rock; from Rome eastward to Little Falls the valley is deeply filled with alluvial deposits, and the flood plains on either side become submerged during freshets, thus acting to some extent as storage reservoirs. At Little Falls the river cuts through a rocky gorge, whose walls rise precipitously 500 or 600 feet.

Below Rome the fall of the river is small and rather uniform, being made up of long quiet reaches with slight riffles; but at Little Falls this uniformity is broken, and the stream descends in a succession of falls about 45 feet in 2,500. The average fall between Rome and the lower aqueduct at Crescent, a distance of 110.7 miles, is 2.43 feet per mile; thence to the level of slack water above Troy dam there is a farther descent of 149.5 feet in 4.4 miles, but of this 105 feet is included within the improved power at Cohoes.

The principal tributaries of the Mohawk below the source are, successively, Oriskany, West Canada, East Canada and Schoharie creeks.

The Erie canal runs parallel to the Mohawk through most of its course below Rome and derives a part of its water-supply from the river. Feeder dams for purposes of diversion are located on the river at Delta, Rome, Little Falls, Rocky Rift and Rexford Flats. A dam at Oriskany creek also diverts into the canal a portion of the flow of that tributary, as well as waters brought into the Mohawk basin from storage reservoirs located in the upper drainage basin of Chenango river near Hamilton, N. Y. There is also a diversion dam near the mouth of Schoharie creek, the largest tributary of the Mohawk.

MOHAWK RIVER AT COHOES, N. Y.

This gaging station, which is located at the Cohoes Water Company's dam, was established April 1, 1904, by E. A. Lamb of this Department in conjunction with the United States Weather Bureau. The gage board is secured to inside of breakwater at north end of forebay about 200 feet above the dam, with its zero mark at elevation 153.47. The gage is graduated in feet and tenths and is read twice daily by William Butler.

The present dam is of masonry, and is built immediately downstream from old wooden dam, which now acts as a timber approach, having a slope of 1 on 2½. The top of masonry dam slopes away from crest at the rate of 1 on 5, the total width being ten feet. The average elevation of crest is 154.2 and its length is 1,279 feet; there is an additional spillway in gate-house of 24 feet, making total length of spill, 1,303 feet.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Cohoes, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	156.8	154.7	154.1	156.8	156.1	154.9	154.6	154.4	154.5	155.4	155.4	155.4
2	156.5	154.8	154.0	156.2	156.3	155.0	154.7	154.4	154.5	155.3	155.5	155.1
3	156.4	155.1	154.8	155.8	156.1	154.9	154.9	154.5	153.9	155.0	155.9	155.0
4	158.1	155.0	154.1	155.5	155.9	155.0	155.1	154.9	153.9	155.1	156.5	154.9
5	157.9	154.7	154.0	155.5	156.0	155.0	154.8	154.5	155.0	155.8	156.2	154.5
6	157.4	154.6	154.6	155.5	155.9	155.0	154.7	154.3	155.2	156.0	155.9	154.5
7	156.6	154.6	154.8	155.6	155.8	155.4	154.8	154.3	155.1	155.4	157.7	154.5
8	156.8	154.7	154.8	155.4	155.8	155.6	154.6	154.2	155.2	155.5	159.0	154.8
9	156.5	154.7	154.9	155.3	155.7	155.5	154.2	154.1	155.2	156.2	157.3	154.9
10	156.3	154.9	155.1	155.3	155.5	155.0	153.7	154.1	154.9	156.2	157.0	155.5
11	155.7	154.8	154.8	155.3	155.4	155.0	153.7	154.5	155.0	155.8	156.1	157.7
12	155.5	154.7	154.8	155.6	155.6	155.0	154.4	153.7	155.2	155.8	155.7	157.0
13	155.8	154.7	154.8	155.9	155.3	154.9	155.1	153.4	156.0	155.9	155.5	156.8
14	155.9	154.7	154.9	156.1	155.2	154.8	155.4	153.5	156.1	155.4	155.4	155.8
15	155.3	154.7	155.8	155.9	155.1	154.8	154.9	153.5	155.1	155.2	155.2	155.6
16	155.0	154.9	156.3	155.5	155.1	154.7	154.7	153.8	154.7	155.1	155.3	155.3
17	155.0	155.0	156.3	155.4	155.2	154.7	154.6	154.3	154.7	155.0	155.3	155.3
18	154.8	154.7	156.2	155.4	155.2	154.7	155.8	154.6	154.6	155.0	155.2	155.3
19	154.9	154.6	156.2	155.3	155.3	154.6	154.7	154.6	154.5	155.0	155.1	155.2
20	155.3	154.1	156.1	155.3	155.2	154.5	154.7	154.6	154.4	155.1	155.0	155.6
21	156.4	154.6	156.1	155.5	155.0	154.4	154.9	154.6	154.6	155.8	155.0	155.1
22	155.8	154.6	156.1	155.2	155.0	154.4	154.7	154.6	154.8	154.7	155.0	155.5
23	155.4	154.6	156.8	154.9	154.9	154.5	154.5	154.6	154.7	154.7	155.2	155.3
24	154.9	154.8	157.6	155.8	154.8	154.3	154.4	154.6	154.8	154.7	155.3	156.4
25	154.7	154.4	157.1	156.9	154.8	154.1	154.5	154.7	154.9	154.7	155.0	157.1
26	154.8	154.3	156.7	156.6	155.0	154.0	154.6	153.5	155.0	154.8	155.0	156.4
27	154.9	154.3	156.7	157.5	155.1	153.9	154.8	153.4	154.9	155.0	154.9	156.2
28	154.6	153.7	156.9	157.0	155.5	154.4	154.9	153.2	154.9	154.9	155.1	156.0
29	154.7	.....	157.3	156.5	155.4	154.6	154.6	153.2	155.1	156.7	155.1	156.8
30	154.5	.....	157.1	156.2	155.2	154.8	154.4	153.1	155.1	156.6	155.1	156.3
31	154.5	....	156.9	......	154.9	......	154.2	153.9	.....	156.0	...	156.4

Current-meter Discharge Measurements of Cohoes Power Co.'s Canal at Cohoes, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
May 13	Horton and Weeks	......	......	636	2.44	1,551
May 28	Weeks and Niles	......	......	662	2.39	1,580
Aug. 7	Weeks and Quinn	......	......	596	2.74	1,634

MOHAWK RIVER NEAR DUNSBACH FERRY, N. Y.

This gaging record is kept at the dam of the West Troy Water Company, one-fifth mile above Dunsbach Ferry bridge, 9 miles from the mouth of the river. The dam is in two sections, situated on opposite sides of a Hudson river shale island. The left wing at the upper end of the island has a crest length of 380 feet. The right wing, 500 feet down-stream at the foot of the island, has a crest 280 feet long.

The record was established, March 12, 1898, for the primary purpose of checking a system of levels for the United States Board of Engineers on Deep Waterways, by D. J. Howell, C. E., who has furnished the earlier portion of the record. No record was kept from April 1, 1899, to August 1, 1900. During the period 1900–1907, the record was maintained under the direction of the U. S. Geological Survey in coöperation with this Department.

In the pumping station adjoining the dam there are two turbines of the old American type, one 66 inches and the other 75 inches in diameter. A new 54-inch Victor turbine was installed during 1902. The discharge is calculated from the recorded daily run of the water-wheels and working head. The turbines drive pumps, taking water from the river for water-supply purposes, the capacity of the pumps being 3,500,000 gallons per day, equivalent to a continuous flow of 5.4 second-feet.

The dam is of masonry, with a flat granite crest 5.5 feet wide. It was rebuilt in 1903, and a new profile obtained. The crest gage is attached to the timber cribbing 50 feet above the lower section of the dam, with its zero mark at elevation 172.00, referred to the United States Deep Waterways datum. Gage readings are taken twice daily at intervals of about 12 hours, by Robert Wilson. The mean of the two daily readings is used in computing the flow. The discharge over the main dam has been calculated by means of the weir formula, using coefficients derived from the United States Geological Survey experiments.

During high water the current of the stream through the cross-section of the channel leading to the lower dam has a velocity of several feet per second. The head due to this velocity has been added to the observed head as a corrction for velocity of approach to the lower dam. The upper dam is situated 450 feet up-stream from the crest gage.

Mean Daily Discharge, Second-feet, of Mohawk River at Dunsbach Ferry, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	19,240	2,930	1,870	18,870	13,730	3,760	1,760	1,640	730	7,430	7,940	5,060
2	47,460	2,760	1,870	13,730	13,730	3,430	2,100	1,410	730	7,180	6,680	4,410
3	35,110	2,760	1,870	9,560	11,240	3,260	2,600	1,410	730	7,430	8,440	4,190
4	55,230	2,760	1,640	8,440	9,280	3,100	2,930	1,520	786	6,930	6,930	4,620
5	35,110	2,760	1,640	8,190	9,560	3,590	3,430	1,520	2,760	10,400	5,920	5,060
6	25,820	3,100	1,870	8,190	9,840	4,410	3,100	1,410	5,270	12,480	11,860	3,980
7	17,420	2,760	1,980	7,680	9,560	6,420	2,430	1,760	3,980	8,720	30,940	3,260
8	21,860	2,760	2,100	6,930	9,000	8,720	2,100	1,520	3,260	8,440	41,380	2,930
9	17,420	2,430	2,270	6,930	9,280	7,180	1,870	1,410	2,270	13,420	23,440	3,072
10	12,800	2,600	2,270	6,680	8,190	4,840	1,520	1,410	2,100	10,680	17,760	10,120
11	10,680	2,430	2,100	6,420	7,180	3,980	1,520	1,180	1,980	8,720	13,730	39,400
12	7,680	2,430	2,100	7,940	6,420	3,430	2,600	1,066	3,980	9,840	10,400	22,250
13	6,930	2,430	2,270	9,840	5,920	3,260	3,430	950	10,680	8,190	9,000	14,040
14	6,680	2,430	2,760	10,400	5,270	3,100	2,760	840	7,430	7,180	6,420	10,120
15	6,170	2,100	9,280	10,400	5,060	2,760	2,270	840	5,700	5,890	5,270	9,000
16	3,590	2,100	13,730	8,190	4,840	2,430	2,100	840	3,430	4,840	4,840	7,940
17	3,100	2,100	12,800	7,430	5,060	2,100	2,270	786	2,930	3,760	4,410	6,930
18	2,430	2,100	14,690	6,680	5,060	2,100	2,930	730	2,430	3,590	4,190	5,700
19	2,430	2,100	13,420	6,420	4,620	2,100	2,270	730	1,980	2,270	3,760	5,010
20	4,190	2,100	12,170	5,700	4,620	2,100	2,100	730	1,760	2,430	3,760	4,474
21	6,930	2,100	12,800	5,060	4,190	2,100	2,270	786	1,760	3,590	3,760	3,930
22	5,920	2,100	13,420	4,410	3,980	2,100	2,100	840	1,870	3,430	4,410	5,230
23	4,840	1,520	16,740	4,840	3,980	1,870	1,870	840	2,100	3,260	4,840	4,754
24	4,190	1,870	33,700	9,000	3,590	1,640	1,870	840	2,430	2,930	4,410	14,690
25	3,590	1,870	23,440	20,350	3,260	1,640	1,980	730	2,930	2,760	3,760	22,640
26	2,270	1,870	19,980	16,060	3,260	1,520	2,430	730	3,590	2,760	3,590	16,400
27	2,600	1,870	17,080	29,140	4,190	1,640	3,260	730	3,100	2,600	3,980	14,040
28	2,930	1,870	21,860	20,350	7,180	1,640	2,930	730	2,930	3,100	4,410	13,110
29	3,100	......	25,820	14,350	5,700	1,410	2,600	730	3,760	18,500	4,840	13,420
30	3,260	......	27,070	11,860	5,060	1,640	2,100	786	5,270	18,500	5,700	13,110
31	3,100	......	25,820	......	3,980	......	1,760	840	......	10,960	......	12,220
Mean	12,390	2,322	11,046	10,335	6,640	3,109	2,363	1,041	3,155	7,168	9,026	9,829

Monthly Discharge of Mohawk River at Dunsbach Ferry, N. Y.

[Drainage area, 3,440 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	55,230	2,270	12,390	3.59	4.13
February	3,100	1,520	2,322	0.673	0.700
March	33,700	1,640	11,046	3.20	3.68
April	29,140	4,410	10,335	3.00	3.36
May	13,730	3,260	6,640	1.92	2.21
June	8,720	1,410	3,109	0.902	1.01
July	3,430	1,520	2,363	0.685	0.788
August	1,760	730	1,041	0.302	0.347
September	10,680	730	3,155	0.915	1.02
October	18,500	2,270	7,168	2.08	2.39
November	41,380	3,590	9,026	2.62	2.93
December	39,400	2,930	9,829	2.85	3.28

MOHAWK RIVER AT REXFORD FLATS, N. Y.

A gage was established August 24, 1905, by this Department, above the State feeder dam at Rexford Flats. A box-and-chain gage is located on the right-hand, or south abutment of the dam, a few feet up-stream from the crest line. The elevation of water-surface, when the gage reads zero, is 208.16; standard chain length 10.75. Readings are taken each morning and afternoon by J. Reepmeyer, Jr., and a record was formerly maintained at this dam to determine the discharge. The results may be found in the report of the State Engineer and Surveyor for 1902, Supplement, pages 186–192. During the navigation season part of the flow of the Mohawk river is diverted to Erie canal through the Rexford Flats feeder.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Rexford Flats, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	212.6	209.6	208.2	212.8	......	209.8	209.4	208.2	208.2	210.7	210.3	210.0
2	210.8	209.6	209.2	211.6	......	209.7	209.6	208.2	208.2	210.6	210.3	209.9
3	......	209.2	209.2	211.2	......	209.7	209.5	208.2	208.2	210.5	210.9	209.8
4	213.3	209.2	209.2	210.8	......	209.6	209.4	209.2	209.4	210.6	211.6	209.8
5	214.5	209.2	209.2	210.5	......	209.7	209.4	209.3	210.9	211.1	211.0	209.7
6	......	209.2	209.2	210.3	......	209.8	209.3	209.2	211.5	210.7	210.9	209.7
7	......	209.2	209.2	210.2	......	209.7	209.3	208.2	210.4	210.3	214.6	209.6
8	......	209.2	209.2	210.1	......	209.7	209.2	208.2	210.0	210.5	215.1	209.7
9	......	209.2	209.2	210.0	210.7	209.6	209.2	208.2	209.8	212.0	214.0	210.0
10	211.2	209.2	209.3	210.2	210.5	209.6	208.2	208.2	209.8	211.3	213.1	210.6
11	211.1	209.2	209.3	210.2	210.4	209.5	208.2	208.2	209.9	211.0	212.6	214.6
12	210.8	209.2	209.3	211.0	210.4	209.4	209.5	208.2	210.8	210.8	211.7	212.7
13	210.4	209.2	209.4	211.0	210.3	209.3	209.8	208.2	211.0	210.6	211.3	212.1
14	210.0	209.2	209.9	211.2	210.1	209.3	209.7	208.2	210.5	210.5	211.1	211.2
15	209.8	209.2	211.0	211.2	210.0	209.2	209.6	208.2	210.1	210.2	210.5	210.6
16	209.7	209.2	211.8	211.2	210.1	209.2	209.6	208.2	210.0	210.0	210.0	210.4
17	209.7	209.2	211.6	210.8	210.0	208.7	209.5	208.2	209.9	209.8	209.9	210.4
18	209.5	209.2	211.7	210.4	210.1	208.2	209.5	208.2	209.8	209.6	209.7	210.4
19	209.3	209.2	211.7	210.0	210.1	208.2	209.8	208.2	209.8	209.5	209.6	210.4
20	209.5	209.2	211.3	210.0	210.0	208.3	209.6	208.2	209.7	209.5	209.4	210.3
21	211.5	209.2	210.9	209.8	209.9	208.3	209.9	208.2	209.7	209.4	209.4	210.2
22	211.1	209.2	210.8	209.8	209.9	208.2	209.7	208.2	209.6	209.3	209.5	210.1
23	210.6	209.2	212.2	209.8	209.8	208.2	209.7	208.2	209.6	209.2	209.4	210.4
24	210.1	208.2	213.3	210.9	209.7	208.2	209.7	208.2	210.0	209.2	209.4	212.9
25	209.7	208.2	213.0	212.4	209.6	208.2	209.7	208.2	210.0	209.2	209.4	212.7
26	209.6	208.2	212.6	212.2	209.6	208.2	209.6	208.2	209.9	209.2	209.6	211.5
27	209.6	208.2	212.2	213.6	209.9	209.2	209.5	208.2	209.8	209.2	209.5	211.0
28	209.6	208.2	212.8	212.8	210.5	208.7	209.4	208.2	209.8	209.2	209.6	211.5
29	209.6	......	213.7	......	210.2	208.2	209.3	208.2	210.0	212.5	209.7	212.3
30	209.5	......	213.6	......	209.9	209.2	209.2	208.2	210.2	212.0	209.8	212.3
31	209.6	......	213.3	......	209.8	......	209.2	208.2	......	210.9	......	211.8

Current-meter Discharge Measurements of Rexford Flats Feeder at Rexford Flats, N. Y.

DATE.	Hydrographer.	Stage. *a*	Discharge.
1907.		*Feet.*	*Second feet.*
May 8	Weeks and Niles	15 7	158
May 9	Weeks and Niles	16.0	202

a Distance to water-surface from a reference point, which is blue chalk mark on outer corner of cement retaining wall just back of toll house, left-hand up-stream side of bridge.

MOHAWK RIVER AT SCHENECTADY, N. Y.

A gage was established in the Mohawk river at Scotia bridge, Washington street, Schenectady, April 3, 1904, by this Department. The gage is attached to the down-stream end of the center pier of the bridge. A gage zero is at elevation 208.76. Readings are taken by E. A. Vrooman. This gaging station is maintained in coöperation with the U. S. Weather Bureau, by this Department.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Schenectady, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	216.0	210.4	211.1	214.9	213.1	210.3	209.3	209.6	209.8	211.7	212.1	210.2
2	213.5	210.7	211.4	214.4	212.6	210.5	209.8	209.6	209.8	211.0	210.8	210.2
3	212.2	210.3	210.8	213.7	212.3	210.2	210.4	209.3	209.8	210.6	212.0	210.2
4	216.8	210.3	210.7	212.8	213.1	210.8	210.4	209.3	209.9	210.7	212.4	210.1
5	218.6	210.3	210.3	212.2	212.4	210.7	210.2	209.3	210.6	212.8	212.7	210.0
6	216.2	210.3	210.0	211.8	211.9	210.8	209.9	209.5	211.7	212.0	212.8	210.0
7	213.7	210.3	210.0	211.2	211.2	210.9	209.8	209.8	210.8	211.4	218.9	210.0
8	212.9	210.3	210.0	211.2	210.9	210.8	209.6	209.7	210.5	211.8	218.5	210.0
9	212.5	210.3	210.0	211.2	210.6	210.7	209.4	209.6	210.3	213.7	216.1	210.0
10	212.2	210.3	210.0	211.2	210.8	210.4	209.4	209.4	210.2	212.9	213.6	211.9
11	211.7	210.3	210.0	211.7	210.8	210.3	209.4	209.3	210.2	212.1	212.7	220.1
12	211.4	210.3	211.6	212.8	210.8	210.1	209.8	209.3	211.4	211.8	212.0	216.5
13	211.5	210.3	212.7	213.2	210.8	210.1	210.3	209.3	212.5	211.7	211.4	214.9
14	211.5	210.3	213.1	212.6	210.7	210.1	210.2	209.3	211.4	211.3	211.1	212.9
15	211.8	210.3	213.5	212.4	210.6	210.0	209.9	209.8	210.7	211.1	210.8	211.8
16	211.4	210.3	213.1	211.8	210.6	210.0	209.4	210.1	210.3	210.7	210.8	211.7
17	211.2	210.3	213.3	212.1	210.8	210.0	209.2	209.9	210.3	210.3	210.8	211.3
18	210.9	210.3	213.3	211.4	210.8	209.8	210.0	209.8	210.3	210.1	210.8	210.8
19	211.0	210.3	213.2	211.0	210.7	209.6	209.9	209.8	209.8	210.1	210.6	210.6
20	211.3	210.3	213.2	210.8	210.7	209.4	209.6	209.8	209.8	210.1	210.3	210.6
21	215.0	210.3	213.3	210.8	210.4	209.2	210.7	209.8	209.7	210.1	210.3	210.6
22	212.9	210.3	214.3	210.8	210.5	209.2	210.2	209.9	209.7	210.1	210.2	210.6
23	212.0	210.3	217.0	211.4	210.3	209.2	209.9	209.9	210.0	210.1	210.2	211.0
24	211.0	210.3	216.1	213.1	210.2	209.2	209.7	210.0	210.1	209.8	210.2	212.4
25	210.4	210.3	215.1	214.2	210.1	209.2	209.4	210.0	210.3	209.8	210.2	214.0
26	210.3	210.3	214.0	214.8	210.2	209.2	209.3	209.9	210.4	209.8	210.2	214.3
27	210.3	210.3	216.2	217.1	210.9	209.2	209.2	209.8	210.4	209.8	210.2	213.0
28	210.3	210.3	216.2	216.4	211.3	209.2	209.7	209.8	210.4	211.0	210.2	213.5
29	210.3	......	216.7	214.4	210.9	209.1	209.7	209.8	210.4	215.0	210.2	214.8
30	210.3	......	217.1	213.4	210.6	209.1	209.8	210.0	211.5	214.3	210.2	214.2
31	210.3	......	216.2	......	210.4	......	209.8	209.8	......	214.0	......	213.4

MOHAWK RIVER AT TRIBES HILL, N. Y.

This gaging station, which is located at the suspension bridge over the Mohawk river between Fort Hunter and Tribes Hill, was established April 3, 1904, by E. A. Lamb of this Department in coöperation with the U. S. Weather Bureau. The gage is a vertical board attached to the down-stream end of the north abutment of the suspension bridge. It is graduated in feet and tenths and the elevation of zero is 267.71.

The elevation of bench-mark, marked "U. S. Weather Bureau Tablet No. 13," set in second course of the northeast anchorage of this bridge, is 295.021. Observations of the stage of the stream were taken twice each day by R. S. Marshall, preceding October 1, 1907, and by Robert Hockle since that date.

Current-meter measurements are taken from the down-stream side of the suspension bridge, which is 535.6 feet long between abutments. The channel of the river is straight for some distance each way from the bridge, and the cross-section directly under the bridge and below the bridge is quite uniform. About 300 feet above the bridge rapids are formed during low water, the river being shallow and having a rough and stony bed.

This gaging station is located about 1,000 feet below the junction of the Mohawk river and Schoharie creek, and the record here will show the combined discharge of these streams.

During 1907 the conditions at this station have been modified by construction work for the Barge canal, in progress near-by.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Tribes Hill, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	273.2	268.9	268.1	272.1	271.0	268.4	267.9	267.8	267.3	269.8	269.5	268.8
2	272.1	268.9	268.2	270.9	271.3	268.3	268.5	267.7	267.3	269.1	269.2	268.7
3	271.5	268.8	268.2	270.2	270.4	268.5	269.1	267.7	267.4	268.5	271.1	268.7
4	274.5	268.8	268.2	269.8	270.4	268.9	268.5	268.2	267.5	269.1	271.0	268.5
5	274.6	268.8	268.1	269.8	270.8	268.6	268.1	267.9	269.2	270.6	270.6	268.4
6	273.3	268.7	268.4	270.1	270.3	269.1	267.8	267.8	268.9	270.0	270.1	268.2
7	271.7	268.5	268.4	269.8	270.2	270.1	267.8	267.7	268.4	269.4	275.9	268.4
8	272.3	268.3	268.4	269.4	270.2	269.9	267.8	267.7	268.6	270.0	274.3	268.3
9	271.8	268.2	268.3	269.3	270.0	269.3	267.7	267.7	268.1	271.5	272.6	268.5
10	270.6	268.2	268.2	269.4	269.7	268.6	267.7	267.7	268.1	270.8	271.6	272.3
11	270.2	268.2	268.2	269.2	269.8	268.5	267.8	267.7	268.0	270.2	270.8	274.4
12	269.6	268.1	268.1	269.8	269.7	268.4	268.3	267.5	270.3	270.0	270.1	272.1
13	269.3	268.1	268.2	270.0	269.4	268.8	268.4	267.3	270.2	269.9	269.7	271.2
14	269.2	268.0	269.3	270.6	269.2	268.2	268.2	267.3	269.1	269.5	269.4	270.3
15	269.3	268.1	272.6	270.2	269.1	268.1	268.0	267.7	268.5	269.1	269.2	269.9
16	269.2	268.2	271.6	269.6	268.9	268.0	267.8	267.6	268.2	268.9	269.1	269.7
17	269.1	268.2	271.6	269.6	268.9	268.2	267.7	267.6	268.3	268.7	269.0	269.6
18	269.1	268.2	272.4	269.5	269.0	268.1	268.2	267.4	268.1	268.6	268.8	269.4
19	269.2	268.3	273.6	269.3	268.9	268.1	268.1	267.3	267.9	268.4	268.7	269.3
20	271.1	268.3	273.7	269.2	268.9	268.0	267.9	267.3	267.9	268.3	268.6	269.0
21	270.7	268.2	274.2	269.0	268.8	268.0	268.0	267.5	267.9	268.3	268.7	269.0
22	270.4	268.2	274.2	268.9	268.7	268.0	267.9	267.7	268.1	268.5	268.9	269.0
23	270.1	268.1	273.5	269.1	268.4	268.0	267.7	267.3	268.2	268.4	268.9	268.9
24	269.6	268.1	273.6	272.8	268.3	267.9	267.7	267.3	268.2	268.3	268.8	273.7
25	269.1	268.1	272.4	272.2	268.2	267.9	268.0	267.3	268.8	268.3	268.7	272.4
26	268.9	268.0	272.0	272.0	268.2	267.9	268.4	267.3	268.4	268.1	268.7	271.7
27	268.9	268.1	271.6	273.4	269.2	268.0	268.2	267.3	268.3	268.0	268.8	271.0
28	268.9	268.1	272.8	272.0	269.6	267.9	268.0	267.3	268.5	268.7	268.7	271.6
29	268.9	......	273.6	271.4	269.4	267.9	267.8	267.3	268.8	272.4	269.0	272.0
30	268.9	......	273.6	270.6	268.8	267.9	267.7	267.3	269.9	271.3	269.3	271.0
31	268.9	......	273.3	......	268.4	......	267.8	267.4	.....	270.2	......	271.5

Current-meter Discharge Measurements of Mohawk River at Tribes Hill, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
April 22	Niles and Austin	1.20	......	2,650	1.69	4,470
May 18	E. C. Niles	1.70	......	2,853	2.08	5,939
Aug. 7	E. C. Niles	0.00	......	1,788	0.64	a1,153
Aug. 16	Weeks and M. Conroy	0.22	......	1,670	0.54	a894

a Coffer-dam obstruction up-stream.

SCHOHARIE CREEK DRAINAGE BASIN.

DESCRIPTION OF BASIN.

The source of Schoharie creek is about two miles east of Tannersville, at an elevation of 1,940 feet. The source is within about four miles of the easterly escarpment of the Catskill plateau. The stream valley is broad and the slope moderate throughout the upper regions. A small area, which apparently was formerly tributary to Schoharie creek, has been cut off by erosion and has thus become tributary to Kaaterskill. Nearly the entire drainage basin is irregular and precipitous. It is extensively covered with second-growth forests.

The basin of Schoharie creek is largely overlain by slaty rocks, into which water percolates only to a slight depth. The valley soil is largely thin plastic clay, formed by disintegration of the native rocks. Passing from the head waters toward the mouth, Schoharie creek crosses successively the Devonian sedimentary rocks, chiefly of the Catskill, Oneonta, Ithaca and Hamilton formations. All of these may be considered fairly impervious and free from fissures. It then crosses belts of Silurian formations, including Helderberg, Saline, Niagara and Medina sandstone and limestone. These rocks are underlaid by impervious Hudson river shales, but are themselves permeable, yielding numerous springs at the lower partings.

The entire drainage basin is shown on the topographic maps of the U. S. Geological Survey, the elevation and area at different points along the stream being as follows:

*Drainage Area of Schoharie Creek.**

LOCATION.	DISTANCE IN MILES.†			Elevation.	FALL IN FEET.		DRAINAGE AREA IN SQUARE MILES.	
	From mouth.	From Prattsville.	Place to place.		Place to place.	Per mile.	Point to point.‡	Total.
Reservoir site	64.0	0	....	1,240	......	......	228	228
Prattsville gage	62.5	1.5	1.5	1,160	80	53.3	10.4	238.4
Devasego Falls	60.5	3.5	3.0	1,100	60	30.0	8.1	246.5
Gilboa	55.5	8.5	5.0	1,000	100	20.0	58.5	305
North Blenheim	48.5	15.5	7.0	800	200	22.3	92.9	397.9
Breakabeen	43.0	21	5.5	710	90	16.4	23.8	421.7
Middleburg	35.0	29	8.	620	90	11.2	105.7	527.4
Schoharie	29.5	34.5	5.5	590	30	5.5	26.6	554
Mouth of Fox creek	28.0	36.0	1.5	585	5	3.3	90.5	644.5
Above Cobleskill cr'k	24.0	40.0	4.0	580	5	1.2	12.8	657.3
Mouth of Cobleskill	24.0	40.0	0	580	0	......	135.9	793.2
Esperance	18.0	46.0	6.0	560	20	3.3	63.2	856.4
Burtonsville	14.5	49.5	3.5	520	40	11.4	14	870.4
Mill Point branch	6.0	58.0	8.5	340	180	21.1	30.3	900.7
Mouth (Ft. Hunter)	0	64.0	6.0	280	60	7.5	8.6	909.3

* From U. S. Geological Survey topographic maps.
† Measured along general course of stream.
‡ From head.

The results of gagings of this stream at stations formerly maintained may be found in the report of the State Engineer and Surveyor for 1902. Supplement pages 169–180.

SCHOHARIE CREEK AT FORT HUNTER, N. Y.

A gage was erected on Schoharie creek above the State feeder dam at Fort Hunter November 17, 1904, by C. A. Poole, of this Department. The gage is maintained in coöperation with the U. S. Weather Bureau. The gage is attached to the down-stream wing wall of the right-hand abutment of the West Shore R. R. bridge. It is vertical and divided to feet and tenths and is in two sections, the lower section reading from zero to 3.9, the upper section reading from 3.9 to 16 feet. The zero mark is at elevation 280.5. Readings are taken at 8 A. M. and 6 P. M. each day by E. L. Hoffman. The results of current-meter measurements made during 1907 to determine the amount of diversion through the canal feeder are shown in the accompanying table.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Schoharie Creek at Fort Hunter, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	286.17	282.20	282.45	282.60	282.50	281.70	280.95	279.95	278.15	281.90	282.40	281.90
2	284.05	282.20	282.75	282.35	282.35	281.65	281.50	279.80	277.90	281.75	282.25	281.90
3	283.90	282.25	282.50	282.25	282.30	281.90	281.50	279.80	278.05	281.65	283.30	281.90
4	284.65	282.45	282.35	282.20	282.20	282.40	281.35	279.55	278.50	282.20	283.35	281.90
5	283.20	282.45	282.60	282.20	282.50	282.10	281.25	279.50	278.50	282.40	282.60	281.90
6	282.70	282.30	282.45	282.20	282.25	282.05	280.45	279.45	279.10	282.10	282.70	281.90
7	282.40	282.30	282.25	282.10	282.20	282.10	280.30	279.10	281.50	281.95	287.40	281.90
8	282.70	282.30	282.20	282.00	282.50	282.00	280.35	279.10	281.45	281.90	284.40	281.90
9	282.70	282.30	282.20	282.00	282.35	281.90	280.00	279.35	280.70	282.40	283.35	281.90
10	282.45	282.30	282.30	282.00	282.30	281.85	280.00	279.30	280.25	282.10	283.15	285.07
11	282.35	282.30	282.20	282.10	282.25	281.80	280.05	279.35	280.80	281.95	283.00	285.40
12	282.50	282.30	282.00	282.25	282.20	281.80	281.40	278.70	281.75	281.90	282.80	283.45
13	282.35	282.30	282.00	282.45	282.05	281.80	281.90	279.25	281.90	281.95	282.35	282.70
14	282.50	282.30	283.35	282.80	281.95	281.65	281.60	278.60	281.60	281.90	281.95	282.45
15	282.45	282.30	284.05	282.70	281.90	281.60	281.50	278.60	281.60	281.80	281.85	282.30
16	282.25	282.30	283.20	282.55	281.80	281.50	281.25	278.65	281.45	281.70	282.00	282.25
17	282.10	282.40	282.95	282.70	281.95	281.50	281.20	278.80	281.20	281.70	282.00	282.20
18	281.85	282.90	283.05	282.55	282.05	281.45	281.20	278.75	280.50	281.60	282.00	282.10
19	282.15	282.70	282.65	282.45	282.00	281.45	281.05	278.75	280.80	281.55	282.00	282.10
20	283.37	282.25	282.35	282.40	282.00	281.45	281.50	278.60	280.00	281.50	282.00	282.10
21	282.75	282.50	282.25	282.30	281.95	281.50	281.05	278.35	280.45	281.50	281.90	282.10
22	282.15	282.30	282.40	282.25	281.80	281.40	281.50	278.20	279.95	281.60	281.90	282.10
23	282.05	282.20	283.10	282.35	281.80	281.30	281.35	278.30	279.45	281.55	281.90	282.10
24	282.20	282.20	283.15	283.90	281.75	281.20	281.20	278.30	280.40	281.40	281.90	283.60
25	282.20	282.20	282.85	283.55	281.70	280.95	281.15	278.50	281.40	281.50	281.90	283.45
26	282.20	282.20	282.80	283.10	281.70	280.60	281.15	278.30	281.55	281.50	281.90	282.90
27	282.25	282.20	282.70	283.80	281.95	280.90	280.80	278.65	281.40	281.30	281.90	282.55
28	282.50	282.20	283.00	282.90	282.05	280.25	280.70	278.80	281.50	281.75	281.90	283.15
29	282.50		283.70	282.60	281.95	280.60	280.65	278.75	281.15	284.30	281.90	283.35
30	282.40		283.30	282.40	281.80	280.80	280.40	278.85	282.00	283.45	281.90	283.35
31	282.30		283.00		281.70	......	280.15	279.00	......	282.65	......	283.25

Current-meter Discharge Measurements of Schoharie Creek Feeder at Fort Hunter, N. Y.

DATE.	Hydrographer.	Gage height.a	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
May 13...	E. C. Niles..................	8.4	......	90.5	......	302.34
July 22...	E. C. Niles..................	8.6	......	8	......	272.37
Aug. 7...	E. C. Niles..................	b11.5	......	42.0	1.48	64.01

a Below reference point.
b New reference point on account of low water.

SCHOHARIE CREEK AT SCHOHARIE JUNCTION, N. Y.

A gaging station, established April 3, 1904, at Schoharie Junction is maintained by this Department in coöperation with the U. S. Weather Bureau. Preceding July 30 the readings during 1907 were taken by measuring down to water-surface with a steel tape from a reference point on the D. & H. R. R. bridge. Beginning July 30, 1907, a box-and-chain gage has been used. The gage is attached to the ties of the up-stream track near the right-hand end of the bridge. The standard chain length 33.00 feet. The scale is graduated to feet and tenths from zero to 14 feet. Readings are taken at 6 A. M. and 6 P. M. each day by A. M. Spencer. The gage is located a short distance below the junction of Cobleskill with Schoharie creek. Elevation of water-surface, when gage reads zero, is 565.96.

Mean Daily Elevation of Water-surface of Schoharie Creek at Schoharie Junction, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	578.9	571.5	569.6	570.0	569.7	567.8	567.4	567.1	566.4	568.9	570.2	568.3
2	573.5	571.5	569.5	569.1	569.5	567.7	567.5	567.1	566.6	568.4	569.2	568.3
3	574.2	571.5	569.3	568.7	569.3	568.8	567.4	567.1	566.5	568.4	574.7	568.4
4	575.3	571.4	569.9	568.7	569.2	568.8	567.4	567.1	566.4	569.8	571.1	568.4
5	570.6	571.0	570.1	568.7	569.8	568.9	567.3	567.0	568.2	569.7	569.0	568.6
6	569.0	571.0	569.9	568.7	569.2	568.7	567.2	567.0	567.6	568.9	570.0	568.6
7	568.8	570.9	569.7	568.4	569.2	568.7	567.2	566.9	567.5	568.6	581.8	568.4
8	570.0	570.8	569.6	568.4	569.6	568.5	567.1	566.9	567.2	568.7	573.6	568.4
9	569.7	570.3	569.5	568.4	569.5	568.4	567.1	567.0	567.4	569.7	571.6	568.3
10	568.7	570.7	569.6	568.5	569.3	568.3	567.1	566.9	567.6	568.9	571.0	575.8
11	568.8	570.6	569.6	568.4	569.1	568.2	567.2	566.9	568.5	568.7	570.4	574.8
12	568.7	570.6	569.6	568.6	568.9	568.0	567.8	566.8	568.6	568.6	569.7	571.9
13	568.5	570.5	570.0	568.9	568.8	567.9	567.5	566.7	568.1	568.6	569.1	570.0
14	568.7	570.5	575.2	569.1	568.6	567.8	567.4	566.7	567.8	568.5	569.0	569.4
15	568.9	570.5	578.5	569.3	568.5	567.7	567.4	566.6	567.5	568.3	568.9	569.2
16	568.7	570.5	576.7	569.4	568.4	567.6	567.3	566.6	567.5	568.1	568.7	569.2
17	569.3	570.5	576.7	569.6	568.9	567.6	567.2	566.5	567.2	568.0	568.6	569.0
18	569.6	570.4	572.1	569.6	568.8	567.5	567.5	566.5	567.1	567.9	568.6	568.8
19	569.9	570.2	569.4	569.5	568.7	567.5	567.5	566.4	567.1	567.9	568.6	568.8
20	571.9	570.2	568.7	569.3	568.7	567.6	567.4	566.4	567.1	567.9	568.5	568.7
21	569.7	570.1	568.5	568.9	568.6	567.6	567.3	566.5	567.1	567.9	568.5	568.7
22	571.8	570.0	568.9	569.2	568.5	567.5	567.2	566.5	566.9	567.9	568.5	568.7
23	572.1	568.9	570.4	568.6	568.3	567.3	567.3	566.5	567.2	567.8	568.5	569.6
24	572.3	569.7	570.7	572.0	568.2	567.3	567.2	566.5	567.4	567.8	568.5	576.0
25	572.2	569.6	570.2	571.6	568.1	567.2	567.2	566.5	567.7	567.7	568.5	571.2
26	572.3	569.7	569.9	572.0	568.1	567.2	567.1	566.4	567.8	567.7	568.5	570.7
27	572.3	569.7	569.7	571.3	568.6	567.2	567.1	566.4	567.7	567.7	568.4	571.6
28	572.1	......	570.1	570.7	568.7	567.1	567.0	566.4	567.7	569.0	568.4	571.5
29	571.9	......	571.1	570.2	568.5	567.1	567.0	566.4	567.7	573.9	568.4	570.6
30	571.8	......	571.1	569.5	568.4	567.2	567.0	566.4	570.0	572.5	568.3	570.5
31	571.8	......	571.0	......	568.1	......	567.1	566.4	......	571.1	......	570.1

SCHOHARIE CREEK AT MIDDLEBURG, N. Y.

A temporary gaging station was established at Middleburg August 24, 1906, by Robert E. Horton for this Department. The gage consists of an enameled steel scale subdivided to hundredths of a foot, which is attached vertically to a pile forming part of the shore protection on the right-hand bank of the stream, about 300 feet below Middleburg bridge. The zero mark of the gage is 27.6 feet below the top of the iron rod at the upper end of the pile. The stream channel is straight for a considerable distance below and above the gage. The bed is of gravel and cobblestones fairly smooth and permanent. The stream is confined near the right bank during low water and measurements are made by boat or by wading opposite the gage. At ordinary high stages the stream can be measured from the Middleburg bridge. Gage readings are taken each morning and night by Minnie E. Wheeler.

Mean Daily Gage Height, in Feet, of Schoharie Creek at Middleburg, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	4.75	2.47	1.72	3.45	3.68	2.22	1.95	1.25	0.85	2.82	3.48	2.38
2	3.25	2.42	1.90	3.18	3.30	2.28	1.82	1.20	0.85	2.48	3.28	2.32
3	3.00	2.52	2.38	3.00	3.10	3.45	1.72	1.25	0.90	2.30	7.82	2.28
4	3.88	2.50	2.65	2.88	3.30	3.52	1.57	1.20	0.97	3.12	4.48	2.25
5	3.38	2.37	2.62	2.85	3.60	3.05	1.52	1.20	1.42	3.40	3.88	2.18
6	3.08	2.27	2.32	2.70	3.18	3.30	1.45	1.20	2.05	3.90	3.60	2.22
7	4.12	2.20	2.18	2.58	3.22	3.05	1.42	1.15	1.65	2.72	10.40	2.25
8	3.75	2.20	2.10	2.55	3.62	2.85	1.57	1.17	1.47	3.22	6.02	2.25
9	3.75	2.20	2.08	2.58	3.32	2.62	1.47	1.15	1.37	3.42	4.78	2.25
10	2.98	2.25	2.05	2.60	3.22	2.55	1.37	1.10	2.02	2.98	4.20	7.90
11	3.02	2.25	1.98	2.60	3.10	2.42	1.32	1.05	1.87	2.78	3.85	6.68
12	2.88	2.20	2.00	2.85	3.00	2.32	1.82	1.05	3.60	2.98	3.55	4.82
13	2.78	2.15	2.38	3.00	2.80	2.22	2.07	1.00	2.45	2.78	3.30	3.92
14	2.70	2.22	6.22	3.25	2.68	2.12	1.75	0.95	2.05	2.58	3.12	3.60
15	3.25	2.32	4.35	3.18	2.55	2.05	1.55	0.95	1.82	2.45	2.92	3.40
16	2.75	2.37	3.55	3.05	2.65	1.98	1.47	0.90	1.70	2.35	2.78	3.45
17	3.65	2.32	3.42	3.32	3.22	1.88	1.42	0.90	1.62	2.25	2.68	3.20
18	3.62	2.27	3.52	3.08	2.95	1.80	1.77	0.95	1.55	2.18	2.60	3.02
19	3.95	2.17	3.10	3.05	2.98	1.78	1.77	0.90	1.47	2.08	2.62	2.90
20	4.30	2.15	2.85	2.95	2.82	2.08	1.72	0.90	1.40	2.05	2.58	2.82
21	3.12	2.10	2.62	2.80	2.68	1.90	2.07	0.90	1.40	2.22	2.52	2.72
22	2.60	2.00	3.05	3.00	2.50	1.78	1.80	0.90	1.50	2.12	2.50	2.58
23	2.78	1.92	4.17	3.38	2.45	1.68	1.75	0.85	1.65	2.08	2.32	3.45
24	2.62	1.90	4.22	5.32	2.40	1.60	1.67	0.85	1.90	2.00	2.35	6.70
25	2.58	1.85	3.72	4.52	2.28	1.55	1.65	0.90	2.42	1.95	2.40	4.68
26	2.78	1.85	3.62	4.25	2.32	1.55	1.57	0.90	2.05	1.90	2.42	4.15
27	2.75	1.82	3.55	4.42	2.75	1.65	1.45	0.85	1.90	1.88	2.45	3.82
28	2.75	1.80	3.32	3.88	2.80	1.60	1.32	0.85	1.82	4.65	2.42	4.65
29	2.80	......	4.67	3.60	2.58	1.52	1.30	0.87	2.00	6.15	2.65	4.38
30	2.70	......	4.32	3.42	2.38	1.68	1.30	0.85	3.55	4.72	2.50	4.00
31	2.55	......	3.85	......	2.28	......	1.30	0.85	......	3.88	......	4.48

SCHOHARIE CREEK AT PRATTSVILLE, N. Y.

Schoharie creek above Prattsville drains a rugged, mountainous area, almost entirely wooded. The watershed, 238 square miles in extent, lies wholly within Greene county. Rocks of the Catskill formation, chiefly sandstones and conglomerates, lie at or near the surface over most of the area. The basin is surrounded by nearly continuous mountain ranges, and intervening ridges divide the main stream from its principal tributaries — Batavia kill, East kill and West kill.

A gaging station was established November 7, 1902, at the highway bridge in the village of Prattsville, by Robert E. Horton for the U. S. Geological Survey, by which it was maintained in coöperation with this Department until May, 1907, when it was taken over by the New York Water Supply Department.

The bridge has a single span of 185 feet. In extreme low water the current underneath the bridge is sluggish, and meter measurements are made by fording the stream a short distance below the bridge.

A standard chain gage is attached to the steel floor-beams of the bridge on the up-stream side; length of chain, 25.74 feet. Gage readings are taken each morning and evening by James Brennan. The gage datum is referred to the United States Geological Survey bench-mark — a circle marked on a boulder at the right-hand end of the bridge on the down-stream side; elevation, 1,151.00 feet. Elevation of gage zero, 1,130.03 feet.

The great freshet of October 9–11, 1903, apparently changed the stream-bed and cross-section in the vicinity of the gage. Measurements made during 1904 to 1907 have been applied toward the construction of a new rating curve.

Mean Daily Gage Height, in Feet, of Schoharie Creek at Prattsville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907:												
1	a 6.10	a 6.55	a 5.50	5.50	......	......	......	......	......	......	......	......
2	a 5.50	a 6.60	a 5.50	5.40	......	......	......	......	......	......	......	......
3	a 5.30	a 6.50	a 5.90	5.25	......	......	......	......	......	......	......	......
4	a 6.00	a 6.35	a 5.90	5.20	......	......	......	......	......	......	......	......
5	a 5.50	a 6.30	a 5.90	5.15	......	......	......	......	......	......	......	......
6	a 5.30	a 6.30	a 5.90	5.05	......	......	......	......	......	......	......	......
7	a 5.40	a 6.30	a 5.90	4.95	......	......	......	......	......	......	......	......
8	a 5.85	a 6.30	a 5.90	5.00	......	......	......	......	......	......	......	......
9	a 5.70	a 6.20	a 5.80	5.00	......	......	......	......	......	......	......	......
10	a 5.40	a 6.20	a 5.70	5.00	......	......	......	......	......	......	......	......
11	a 5.30	a 6.20	a 5.50	5.00	......	......	......	......	......	......	......	......
12	a 5.20	a 6.15	a 5.50	5.15	......	......	......	......	......	......	......	......
13	a 5.10	a 6.15	a 5.90	5.25	......	......	......	......	......	......	......	......
14	a 5.20	a 6.10	a 8.00	5.30	......	......	......	......	......	......	......	......
15	a 5.40	a 6.10	7.00	5.30	......	......	......	......	......	......	......	......
16	a 5.30	a 6.10	5.50	5.25	......	......	......	......	......	......	......	......
17	a 5.30	a 6.10	5.50	5.25	......	......	......	......	......	......	......	......
18	a 6.30	a 6.05	5.40	5.20	......	......	......	......	......	......	......	......
19	a 6.45	a 6.05	5.20	5.20	......	......	......	......	......	......	......	......
20	a 6.35	a 6.00	5.20	5.15	......	......	......	......	......	......	......	......
21	a 6.30	a 5.90	4.80	5.10	......	......	......	......	......	......	......	......
22	a 6.50	a 5.80	5.30	5.20	......	......	......	......	......	......	......	......
23	a 7.00	a 5.80	6.10	5.45	......	......	......	......	......	......	......	......
24	a 7.10	a 5.80	6.10	7.20	......	......	......	......	......	......	......	......
25	a 7.00	a 5.90	5.80	6.30	......	......	......	......	......	......	......	......
26	a 7.00	a 5.90	5.50	6.30	......	......	......	......	......	......	......	......
27	a 7.00	a 5.80	5.05	6.00	......	......	......	......	......	......	......	......
28	a 6.90	a 5.70	6.55	5.70	......	......	......	......	......	......	......	......
29	a 6.80	......	6.40	5.60	......	......	......	......	......	......	......	......
30	a 6.70	......	6.20	5.50	......	......	......	......	......	......	......	......
31	a 6.60	......	5.80	......	......	......	......	......	......	......	......	......

a Ice obstruction.

Mean Daily Discharge, Second-feet, of Schoharie Creek at Prattsville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	a	a	a	585	......	......	......	......	......	......	......	......
2	a	a	a	525	......	......	......	......	......	......	......	......
3	a	a	a	435	......	......	......	......	......	......	......	......
4	a	a	a	405	......	......	......	......	......	......	......	......
5	a	a	a	375	......	......	......	......	......	......	......	......
6	a	a	a	315	......	......	......	......	......	......	......	......
7	a	a	a	265	......	......	......	......	......	......	......	......
8	a	a	a	285	......	......	......	......	......	......	......	......
9	a	a	a	285	......	......	......	......	......	......	......	......
10	a	a	a	285	......	......	......	......	......	......	......	......
11	a	a	a	285	......	......	......	......	......	......	......	......
12	a	a	a	375	......	......	......	......	......	......	......	......
13	a	a	a	435	......	......	......	......	......	......	......	......
14	a	a	a	465	......	......	......	......	......	......	......	......
15	a	a	2,100	465	......	......	......	......	......	......	......	......
16	a	a	585	435	......	......	......	......	......	......	......	......
17	a	a	585	435	......	......	......	......	......	......	......	......
18	a	a	525	405	......	......	......	......	......	......	......	......
19	a	a	495	405	......	......	......	......	......	......	......	......
20	a	a	405	375	......	......	......	......	......	......	......	......
21	a	a	205	345	......	......	......	......	......	......	......	......
22	a	a	465	405	......	......	......	......	......	......	......	......
23	a	a	1,070	555	......	......	......	......	......	......	......	......
24	a	a	1,070	2,390	......	......	......	......	......	......	......	......
25	a	a	819	1,270	......	......	......	......	......	......	......	......
26	a	a	585	1,270	......	......	......	......	......	......	......	......
27	a	a	315	975	......	......	......	......	......	......	......	......
28	a	a	1,530	741	......	......	......	......	......	......	......	......
29	a	a	1,370	663	......	......	......	......	......	......	......	......
30	a	a	1,170	585	......	......	......	......	......	......	......	......
31	a	a	819	......	......	......	......	......	......	......	......	......
Mean	a	a	825	568	......	......	......	......	......	......	......	......

a Jan. 1 to March 15, ice obstruction.

Rating Table for Schoharie Creek at Prattsville, N. Y., for 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
4.10	18	5.30	465	6.50	1,470	7.70	3,150
4.20	28	5.40	525	6.60	1,600	7.80	3,300
4.30	42	5.50	585	6.70	1,720	7.90	3,460
4.40	61	5.60	663	6.80	1,850	8.00	3,620
4.50	85	5.70	741	6.90	1,970	8.20	3,960
4.60	125	5.80	819	7.00	2,100	8.40	4,300
4.70	165	5.90	897	7.10	2,260	8.60	4,640
4.80	205	6.00	975	7.20	2,390	8.80	4,980
4.90	245	6.10	1,070	7.30	2,540	9.00	5,320
5.00	285	6.20	1,170	7.40	2,680	9.20	5,680
5.10	345	6.30	1,270	7.50	2,830	9.40	6,040
5.20	405	6.40	1,370	7.60	2,990	9.60	6,400

The above table is applicable only for open-channel conditions. It is based on discharge measurements made during 1904 and 1906. It is well defined between gage heights 4.1 feet and 8 feet. Above 4.4 feet the table is the same as for 1904.

Monthly Discharge of Schoharie Creek at Prattsville, N. Y.
Drainage area, 240 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
March (17 days)	2,100	205	825	3.44	3.96
April	2,390	265	568	2.37	2.65

MOHAWK RIVER AT FULTONVILLE BRIDGE, FONDA, N. Y.

This gaging station was established April 29, 1906, by R. H. Merrill, for this Department. A box-and-chain, reading decimally from zero to 12 feet, is located on the down-stream guard-rail of the middle span of the bridge. The standard chain length is 29.03 feet and the gage datum is 270.00. A bench-mark, consisting of a chiseled square on the northeast corner of the wing wall of the south abutment of the bridge, is at elevation 295.75. The stream channel is straight and the river uniform for about one-half mile above and below the bridge. The river becomes ice covered in winter, but the conditions are generally good for current-meter measurements. The bridge comprises three spans and is subdivided to five-foot intervals on the down-stream side, the initial point being at the face of the left-hand abutment.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Fultonville Bridge, Fonda, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	283.0	......	......	280.4	278.8	275.2	......	274.0	273.4	276.8	276.0	275.6
2	281.9	......	276.0	278.8	278.7	275.0	275.6	274.0	273.4	275.8	275.4	275.4
3	281.7	......	......	277.6	278.2	275.0	276.0	274.6	273.6	275.0	277.2	275.2
4	285.3	......	......	277.0	277.5	275.0	275.2	274.6	273.8	276.6	278.5	274.8
5	285.0	277.0 *a*	......	276.9	......	274.8	274.6	274.3	275.8	278.0	278.4	275.2
6	282.6	......	......	277.3	277.8	275.6	274.4	274.0	275.9	277.2	277.0	275.5
7	280.2	......	......	......	277.3	277.3	274.2	274.0	275.0	276.4	284.6	274.8
8	281.0	......	275.9	276.3	277.0	277.2	274.2	274.0	274.6	277.6	282.5	274.8
9	279.6	......	......	276.4	276.3	276.0	274.1	273.8	274.4	280.1	280.7	274.8
10	277.9	......	......	276.4	276.2	275.4	274.1	273.8	274.4	278.8	279.3	279.2
11	277.0	......	......	276.2	276.1	275.2	274.0	273.7	275.2	277.7	277.7	282.2
12	276.5	......	......	277.2	......	275.2	274.5	273.8	278.4	277.3	277.0	279.8
13	......	......	275.7	277.6	276.4	275.0	274.7	273.6	277.8	277.1	276.5	278.6
14	276.0	......	276.0	......	276.0	279.8	274.6	273.7	276.0	276.6	276.0	277.6
15	275.7	......	279.9	277.0	275.9	279.6	274.4	273.7	275.4	276.0	275.8	276.4
16	277.0	......	280.6	276.6	275.6	279.6	274.2	273.8	274.5	275.6	275.6	276.3
17	276.5	......	280.6	276.1	275.4	274.8	274.4	273.6	274.6	275.2	275.4	276.2
18	277.0 *a*	......	281.6	276.0	275.6	279.6	274.8	273.6	274.4	275.0	275.2	276.0
19	277.0 *a*	......	282.3	275.9	......	279.6	274.7	273.6	274.2	274.8	275.2	275.8
20	277.0 *a*	......	282.2	275.7	275.6	274.5	274.6	273.4	274.2	274.6	275.1	275.6
21	280.2	......	281.9	......	275.4	274.5	274.6	273.6	274.3	274.6	275.2	276.0
22	277.0	......	282.0	275.3	275.0	274.3	274.4	273.6	274.6	275.0	275.6	276.0
23	277.0 *a*	......	288.3	275.2	275.0	274.3	274.4	273.6	274.4	279.8	275.6	276.0
24	277.0 *a*	......	282.8	277.1	274.7	274.3	......	273.6	274.6	274.5	275.4	281.2
25	277.0 *a*	......	281.2	280.2	274.6	......	......	273.4	275.7	274.4	275.2	280.1
26	276.5 *a*	276.0	280.6	279.3	274.7	......	......	273.4	275.4	274.4	275.3	279.5
27	......	......	279.8	283.2	276.3	......	......	273.4	275.2	274.3	275.3	278.4
28	......	......	281.7	......	276.6	......	......	273.4	275.2	276.1	275.3	278.6
29	......	......	282.5	279.4	276.2	......	274.1	273.4	275.2	279.8	275.7	279.2
30	......	......	282.9	278.4	275.5	......	274.0	273.4	276.8	278.4	276.0	278.2
31	277.5 *a*	......	282.0	......	275.2	......	274.0	273.5	......	277.0	......	278.4

a Ice obstruction, record defective.

Current-meter Discharge Measurements of Mohawk River at Fonda, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
Mar. 26..	Holmquist, Ripley and Lewis..	10.38	......	3,293	5.24	15,500
Mar. 27..	Holmquist, Ashley and Lewis..	9.68	......	3,044	5.20	14,230
April 1...	Holmquist, Ripley and Lewis..	10.10	......	3,193	5.62	16,150
April 2...	Holmquist, Ripley and Lewis..	8.10	......	2,485	4.35	9,690
April 3...	Holmquist, Ripley and Lewis..	7.45	......	2,254	3.69	7.460
April 9...	Merrill, Morse and McCormick.	6.55	......	1,945	3.16	5,510
Aug. 8...	E. C. Niles..........	4.00	......	1,045	1.08	1,095
Aug. 17..	Weeks and Conroy...........	3.75	......	982	0.76	728
Nov. 8...	Weeks and Quinn...........	12.28	......	3,965	6.90	25,450
Nov. 9...	Weeks and Quinn...........	10.92	......	3,487	6.36	19,910

MOHAWK RIVER AT FORT PLAIN, N. Y.

A gage was established on the highway bridge crossing the Mohawk river at Fort Plain, December 30, 1905, by C. A. Poole, for this Department. A box-and-chain gage is attached to the bridge guard-rail on the down-stream side, 50 feet from the right-hand abutment. The elevation of water-surface, when the gage reads zero, is 290.47. The standard chain length is 29.30. Readings were taken to June 30, 1907, by Abraham Devendorf; beginning July 1, 1907, Charles J. Wood has been the observer. The gage is subdivided to five-foot sections for current-meter measurements. The initial point is the face of the left-hand abutment on the downstream side of the bridge.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Fort Plain, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	299.6	296.4	293.3	297.8	297.1	293.4	293.2	292.1	291.0	295.4	294.7	......
2	298.5	295.9	293.3	296.3	297.3	293.1	294.3	292.6	291.0	294.4	294.5	......
3	298.2	295.9	293.4	295.6	295.9	293.2	294.6	293.4	291.0	293.6	295.9	......
4	303.6	295.8	293.7	295.3	295.9	293.1	293.5	293.2	293.2	296.2	297.2	......
5	302.3	295.8	294.0	295.3	296.3	293.2	292.7	292.5	295.1	296.8	298.6	......
6	299.9	295.6	294.0	295.6	296.4	294.7	292.3	292.3	294.3	295.7	295.8	......
7	298.0	295.2	293.9	295.1	295.4	296.0	292.2	292.3	293.4	295.0	302.7	......
8	298.2	295.0	293.6	294.9	295.4	295.6	291.9	292.1	292.9	297.3	300.6	......
9	297.1	295.1	293.4	294.8	295.1	294.6	291.9	292.0	292.8	298.9	299.2	......
10	296.3	294.8	293.3	294.6	295.1	293.6	292.0	291.9	292.9	297.1	297.8	......
11	295.6	294.7	293.3	294.7	295.2	293.4	292.4	291.9	293.3	296.1	296.6	......
12	294.8	294.5	293.3	295.2	295.0	293.6	292.6	291.4	297.1	296.2	295.7	......
13	294.4	294.3	293.4	295.4	294.5	293.0	292.9	291.5	296.2	295.9	295.2	......
14	294.2	294.2	294.5	295.2	294.2	292.9	292.7	292.1	294.5	295.2	294.9	......
15	294.1	294.1	298.0	294.8	293.9	292.8	292.2	292.1	293.5	294.9	294.7	......
16	293.8	294.2	299.8	294.3	294.1	292.5	292.2	291.8	293.8	294.5	294.4	......
17	293.0	294.1	300.2	294.2	293.9	292.5	292.4	291.5	293.0	294.2	294.3	......
18	293.2	294.4	300.2	294.2	293.9	292.4	293.0	291.6	292.7	294.0	294.2	......
19	293.5	293.8	300.2	294.0	293.8	292.2	292.9	291.3	292.6	293.8	294.2	......
20	296.9	293.9	300.1	293.9	293.8	292.2	292.6	291.2	292.5	293.6	294.1	......
21	298.8	293.8	300.2	293.6	293.6	292.0	292.9	291.6	293.2	293.9	294.3	......
22	300.0	293.5	300.1	293.5	293.3	291.7	292.3	291.5	293.3	293.9	294.6	......
23	299.2	293.4	303.2	293.6	293.2	291.6	292.4	291.3	293.2	293.7	294.4	......
24	299.0	293.3	300.3	297.8	293.0	291.6	292.7	291.3	293.6	293.4	294.2	......
25	296.3	293.2	298.5	298.4	292.8	291.5	293.4	291.2	294.0	293.4	294.2	......
26	295.6	293.4	298.2	299.0	293.1	292.1	293.8	291.2	294.0	293.2	294.2	......
27	296.1	293.3	298.2	299.7	294.8	292.7	293.4	291.0	293.9	293.1	294.2	......
28	296.6	293.3	300.0	298.3	295.9	292.1	292.9	291.2	293.6	296.4	294.3	......
29	296.6	......	300.5	297.2	294.4	292.1	292.3	291.3	294.2	297.8	294.9	......
30	296.5	......	301.1	296.5	293.8	292.4	292.5	291.2	295.4	296.8	294.9	......
31	296.5	......	300.1	......	293.5	......	292.2	291.2	......	295.5	......	......

Current-meter Discharge Measurements o' Mohıwk River at Fort Plain, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
Mar. 26	Holmquist and James	7.61	......	2,805	4.77	13,380
Mar. 27	Holmquist and James	7.35	......	2,719	4.67	12,700
April 2	Holmquist, Ripley and Lewis	5.78	......	2,148	4.05	8,690
April 3	T. M. Ripley	5.00	......	2,000	3.19	6,375
April 5	Niles and McCormick	4.90	......	2,046	3.34	6,840
April 9	McCormick, Merrill and Morse	4.50	......	1,858	3.00	5,570
April 10	McCormick, Merrill and Morse	4.10	......	1,744	2.42	4,220
April 23	E. C. Niles	2.90	......	1,488	1.61	2,405
June 13	E. C. Niles	2.60	......	1,242	1.36	1,688
Aug. 8	E. C. Niles	1.55	......	941	0.76	712
Nov. 7	Weeks and Quinn	12.08	......	4,248	6.97	29,600
Nov. 8	Weeks and Quinn	10.30	......	3,673	6.41	23,550

EAST CANADA CREEK AT DOLGEVILLE, N. Y.

A gaging station on this stream was established for the U. S. Board of Engineers on Deep Waterways in 1898. It has since been maintained by the U. S. Geological Survey in coöperation with this Department.

Observations are taken at High Falls, near Dolgeville, about 7 miles from the outlet of the stream. The gaging station is located at the dam of the Herkimer County Light and Power Company. The dam is of rubble masonry, 19 feet high, and has a flat crest 6 feet wide and 190.25 feet long between abutments. The elevation of the up-stream edge of the crest is 1 foot below that of the lip. The impounded water is conducted to the power-house, 500 feet below the dam, through a wrought-iron flume, 10 feet in diameter.

Readings of the depth on the crest are taken from a vertical gage board attached to the bulkhead, 6 feet up-stream, twice each day by Godfrey Aman. The mean of the readings is used in computing the discharge. A record is also kept of the run of the water-wheels and the elevation of water in the tail-race. The record since January 1, 1903, has been computed from a discharge curve based on the United States Geological Survey experiments on a full-sized model of the dams, made at Cornell University. The flow through the turbines for this period has also been computed from current-meter measurements, made in the tail-race of the electric power-plant instead of from the manufacturer's rating tables for the water-wheels, as formerly. The turbines are of a special Victor cylinder-gate type. The two main wheels are each 36 inches in diameter, and their speed is controlled by Lombard governors. Beginning November 12, 1907, a pair of 36-inch Rodney Hunt turbines have also been in use. Owing to changing flash-board conditions, the record for 1907 is approximate only. During the winter the dam is more or less obstructed by ice at times. The reduction in flow is estimated.

Spruce creek, the principal tributary of East Canada creek, enters 1 mile above Dolgeville, and drains an area of 50 square miles. Water is diverted from this creek and from Beaver creek, one of its tributaries, at Diamond Hill, and is carried to Little Falls through a cast-iron conduit, 9 miles long. The water-supply of Dolgeville is taken from Cold brook, a tributary of East Canada creek. No allowance for diversion of water-supply has been made in computing the run-off for East Canada creek.

Mean Daily Discharge, Second-feet, of East Canada Creek at Dolgeville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1,752	689	186	940	884	181	116	172	105	602	351	261
2	2,224	624	145	527	504	129	231	231	100	382	271	370
3	1,452	771	170	346	358	218	347	145	141	324	631	330
4	3,866	323	152	312	255	114	250	161	246	1,082	878	270
5	3,088	359	148	462	162	218	133	189	249	517	1,007	271
6	2,757	516	141	640	270	902	117	214	250	425	850	266
7	2,413	525	218	167	264	902	100	191	242	462	3,147	269
8	2,079	546	192	260	265	645	100	199	109	1,138	2,422	337
9	1,518	420	169	268	250	654	106	187	246	1,747	1,152	342
10	1,136	670	92	227	259	696	98	104	246	1,247	821	452
11	1,008	441	185	254	126	205	137	223	254	1,271	709	2,050
12	783	252	183	262	126	200	134	138	250	1,070	805	1,749
13	1,113	226	149	208	137	200	203	167	247	1,052	700	1,403
14	598	215	248	181	237	210	141	157	237	1,007	503	1,029
15	368	373	303	250	226	204	147	127	117	456	471	677
16	264	189	377	254	238	91	166	117	242	304	523	872
17	448	260	341	242	235	222	180	105	253	304	404	561
18	649	216	258	246	192	220	241	100	246	274	358	429
19	910	197	251	235	95	164	218	96	238	227	321	452
20	767	210	286	204	235	169	158	106	242	159	278	609
21	504	209	247	102	221	132	112	106	279	283	305	443
22	390	179	322	235	227	112	126	124	168	256	353	283
23	615	179	792	203	216	107	180	105	269	172	246	1,583
24	368	232	902	1,549	216	120	187	100	276	257	356	2,235
25	295	194	621	1,391	185	146	249	85	344	252	333	1,626
26	245	207	460	1,418	100	226	196	95	288	221	334	1,220
27	237	188	838	2,337	253	235	189	105	300	108	278	1,117
28	449	199	2,147	1,005	249	178	63	131	299	757	403	1,125
29	382	......	2,742	631	233	184	84	105	328	1,292	380	814
30	413	......	2,892	470	167	96	113	100	266	792	327	954
31	604	......	2,018	......	236	......	121	105	......	442	......	924
Mean	1,087	343	586	528	246	269	159	138	236	609	661	817

Monthly Discharge of East Canada Creek at Dolgeville, N. Y.
[Drainage area, 256 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	3,866	237	1,087	4.25	4.89
February	771	179	343	1.34	1.39
March	2,892	92	586	2.29	2.63
April	2,337	102	528	2.06	2.31
May	884	95	246	0.962	1.11
June	902	91	269	1.05	1.18
July	347	63	159	0.622	0.715
August	231	85	138	0.540	0.621
September	344	100	236	0.923	1.03
October	1,747	108	609	2.38	2.74
November	3,147	246	664	2.60	2.91
December	2,235	261	817	3.19	3.67

MOHAWK RIVER AT LITTLE FALLS, N. Y.

A gaging station was established at the lower (Gilbert's) dam at Little Falls, N. Y., for the United States Board of Engineers on Deep Waterways in 1898. It has since been maintained by the

U. S. Geological Survey in coöperation with this Department. The dam is of masonry, having the form of a circular arc, and furnishes power for the Astoronga Knitting Mill and the mill of the Little Falls Paper Company. In the Astoronga Knitting Mill are two turbines, built by T. H. Risdon & Co., Mount Holly, N. J. In the mill of the paper company are three Camden turbines and one 60-inch Reddy turbine, built in Little Falls. The Reddy turbine was taken out September 20, 1907. Records of the crest gage and run of the water-wheels at the Astoronga mill are taken by John Schmelze. At the paper mill a record has been kept, beginning June 1, 1907, by C. T. Barrett.

There are three dams at Little Falls. The upper one is a State dam, diverting water for the supply of the Erie canal; the lower two are used for water-power development. The gage record kept at the lower dam shows the amount of water flowing down-stream from Little Falls, but does not include the diversion at the State dam above the gaging station, and hence does not represent the total yield from the tributary drainage area of about 1,306 square miles.

Mean Daily Discharge, Second-feet, of Mohawk River at Little Falls, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	......	......	......	......	......	1,456	1,975	1,044	260	3,254	2,299	2,103
2	......	......	......	......	......	1,084	2,530	1,567	82	1,846	2,058	2,145
3	......	......	......	......	......	1,296	2,581	1,803	507	1,276	4,015	2,081
4	......	......	......	......	......	1,307	1,279	1,388	1,335	3,385	7,453	1,355
5	......	......	......	......	......	1,258	1,151	1,118	2,914	5,516	5,758	929
6	......	......	......	......	......	2,664	1,126	994	1,943	3,675	3,995	1,315
7	......	......	......	......	......	4,770	498	1,024	1,335	3,066	13,437	1,329
8	......	......	......	......	......	3,460	783	889	622	5,744	11,705	1,127
9	......	......	......	......	......	1,862	790	859	977	8,473	9,646	1,621
10	......	......	......	......	......	1,574	834	812	1,020	5,164	5,367	8,824
11	......	......	......	......	......	1,523	769	394	3,514	3,808	4,684	11,594
12	......	......	......	......	......	1,566	1,104	677	6,644	4,024	2,704	8,633
13	......	......	......	......	......	1,145	1,151	719	4,222	3,183	2,856	5,991
14	......	......	......	......	......	994	580	1,387	1,732	2,755	2,706	3,591
15	......	......	......	......	......	1,258	1,136	922	2,105	2,063	2,368	2,512
16	......	......	......	......	......	1,696	834	856	1,190	1,802	1,985	2,423
17	......	......	......	......	......	960	863	722	775	1,430	2,007	2,547
18	......	......	......	......	......	987	1,262	396	898	1,233	2,106	1,949
19	......	......	......	......	......	895	1,262	375	775	1,187	1,972	2,087
20	......	......	......	......	......	865	1,038	662	737	1,197	1,974	2,032
21	......	......	......	......	......	924	1,084	658	1,206	1,614	2,231	2,080
22	......	......	......	......	......	865	1,061	433	1,147	1,564	1,417	1,853
23	......	......	......	......	......	463	1,102	567	1,198	1,380	2,324	3,570
24	......	......	......	......	......	945	1,616	254	1,337	1,284	1,730	8,862
25	......	......	......	......	......	951	1,783	308	1,787	1,245	1,947	8,729
26	......	......	......	......	......	951	2,064	299	1,886	1,206	2,100	8,473
27	......	......	......	......	......	1,022	1,704	457	1,836	910	2,101	6,506
28	......	......	......	......	......	1,020	1,038	517	1,443	5,351	2,181	6,691
29	......	......	......	......	......	985	970	418	1,495	6,772	2,111	6,084
30	......	......	......	......	......	818	936	452	3,391	5,218	2,405	5,737
31	......	......	......	......	......	......	936	325	......	2,995	......	6,840
Mean	......	......	......	......	......	1,385	1,221	751	1,677	3,020	3,721	4.242

Monthly Discharge of Mohawk River at Little Falls, N. Y.

[Drainage area, 1,306 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
June	4,770	463	1,385	1.06	1.19
July	2,581	498	1,221	0.935	1.08
August	1,803	254	751	0.575	0.661
September	6,644	82	1,677	1.17	1.31
October	8,473	910	3,020	2.31	2.66
November	13,437	1,470	3,721	2.85	3.19
December	11,594	929	4,242	3.25	3.74

MOHAWK RIVER ABOVE STATE DAM AT LITTLE FALLS, N. Y.

This gage was established November 18, 1904, by E. A. Lamb and is maintained by this Department in coöperation with the United States Weather Bureau. A vertical gage with painted tenth-foot marks reading from zero to 12 feet is attached to the down-stream portal wall of the discharge culvert of Erie canal waste-weir No. 12 on the right-hand bank of Mohawk river 400 feet up-stream from Hansen avenue. The State dam at Little Falls is a low, timber structure located on the ledge at the head of the falls. The stream is divided by an island, the left-hand wing of the dam being at the upper and the right-hand wing at the lower end of the island. The old Erie canal at the left-hand end of the dam is utilized as a mill-race. At the right-hand end water is diverted for power purposes through Whitman's race. The Erie canal feeder is also located at the right-hand end of the dam. Measurements to determine the flow in these channels during 1907 are given in the accompanying tables. The elevation of the zero mark of the gage is at 360.31. Readings were taken each morning and afternoon by William Quackenbush, preceding December 1, 1907, and by John Stark after that date.

Current-meter Discharge Measurements of Erie Canal Feeder at Bellinger St., Little Falls, N. Y.

DATE.	Hydrographer.	Gage height.[a]	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
May 14[b].	E. C. Niles	5.9	......	83.2	......	114.33
May 24[c].	Horton and Weeks	5.2	......	86.8	......	131.08
June 11..	E. C. Niles	5.4	......	82.1	......	186.68
June 11..	E. C. Niles	5.7	......	79.2	......	142.10

[a] Below reference point.

[b] "O" Right-hand up-stream side of bridge. Reference point, top of iron band holding hand-rail post in place, right-hand down-stream side of bridge.

[c] "O" Right-hand end, up-stream side of bridge. Reference point, corner of stone wall by mill office 20 ft. above bridge.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River above State Dam at Little Falls, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	365.8	363.9	363.9	365.7	365.2	364.0	364.2	363.7	363.3	365.8	363.4	363.3
2	366.2	363.9	363.9	364.7	365.2	363.9	364.2	363.9	363.4	364.9	363.4	363.4
3	368.5	363.9	363.9	364.6	365.0	363.8	364.1	364.0	363.4	364.8	363.4	363.4
4	369.9	364.0	363.9	364.4	364.8	363.9	364.0	363.8	363.4	364.6	363.3	363.4
5	368.7	363.9	363.9	364.6	364.8	364.0	363.8	363.7	363.4	365.1	363.3	363.4
6	367.0	363.9	363.9	364.6	364.7	364.5	363.7	363.7	363.4	365.5	363.3	363.7
7	366.0	363.9	363.9	364.6	364.6	364.8	363.6	363.6	363.4	366.9	363.3	364.0
8	365.0	363.9	363.9	364.2	364.6	364.7	363.5	363.6	363.5	366.2	363.7	364.2
9	364.8	363.9	363.9	364.3	1,364.4	364.6	363.4	363.5	363.8	365.3	364.6	364.2
10	364.7	363.9	363.9	364.3	364.4	364.4	363.3	363.4	364.2	365.2	364.9	364.4
11	364.7	363.9	363.9	364.4	364.4	364.3	363.3	363.4	365.1	365.0	364.6	364.5
12	364.8	363.9	363.9	364.6	364.1	364.1	363.7	363.3	364.6	364.7	364.4	364.7
13	364.6	363.9	363.9	364.4	364.1	364.0	363.9	363.3	364.1	364.5	364.3	364.8
14	364.2	363.9	364.0	364.3	363.9	363.7	363.8	363.3	364.0	364.3	364.2	364.7
15	364.0	363.9	364.6	364.3	363.9	363.7	363.6	363.3	364.0	364.2	364.0	364.6
16	364.0	363.9	365.0	364.1	364.2	363.6	363.4	363.3	364.1	364.1	363.9	364.5
17	363.9	363.9	365.1	364.1	364.2	363.6	363.7	363.5	364.0	363.9	363.7	364.5
18	363.9	363.9	365.3	364.1	364.1	363.5	363.7	363.4	364.0	363.8	363.7	364.4
19	363.9	363.9	365.4	364.1	364.1	363.5	363.7	363.3	364.0	363.7	363.6	364.4
20	367.1	363.9	365.3	364.1	364.1	363.5	363.7	363.3	364.0	363.6	363.5	364.4
21	364.7	363.9	365.8	364.1	364.0	363.4	363.9	363.3	364.0	363.5	363.4	364.4
22	364.5	363.9	365.7	363.9	363.9	363.4	363.8	363.3	364.0	363.5	363.3	364.6
23	364.0	363.9	366.0	363.9	363.8	363.4	363.7	363.3	364.0	363.4	363.4	364.9
24	363.9	363.9	366.3	365.7	363.7	363.4	363.9	363.5	363.9	363.4	363.5	364.8
25	363.9	363.9	366.4	365.4	363.7	363.4	364.1	363.3	363.8	363.4	363.4	364.7
26	363.9	363.9	366.3	366.6	364.2	363.5	364.0	363.3	363.8	363.4	363.4	364.7
27	363.9	363.9	366.7	366.2	364.5	363.6	364.0	363.3	363.9	363.4	363.4	364.6
28	363.9	363.9	366.7	365.6	364.4	363.7	363.9	363.3	364.3	363.4	363.3	364.6
29	363.9	......	367.1	365.2	364.3	363.7	363.8	363.3	365.0	363.4	363.3	364.8
30	363.9	......	367.4	365.2	364.2	364.0	363.8	363.3	365.2	363.4	363.3	365.1
31	363.9	......	366.8	......	364.1	......	363.7	363.3	......	363.3	......	364.8

Mohawk River near Herkimer, N. Y.

This gaging station, which is located at the highway bridge over the Mohawk river between Herkimer and Mohawk, was established November 23, 1904, by C. A. Poole for this Department. The gage is a vertical board secured to the left-hand, or north abutment of the bridge. The gage is in two sections reading from zero to 3.4 feet and from 3.4 to 15.0 feet, respectively. It is graduated in feet and tenths and the elevation of zero is 377.43. Observations of the state of the stream are taken twice each day by Henry Edick, Jr.

The current-meter measurements are made from the downstream side of the bridge, which has a single span of 124.3 feet. The river channel is of uniform cross-section and straight for several hundred feet below the bridge. About 200 feet above the bridge there is a slight bend to the south. During extreme high water the river overflows its banks and flows through additional openings in the dike formed by the highway, and it is necessary to measure this additional flow in order to get the total flood discharge at this station.

This gaging station is located about one and one-quarter miles above the junction of the Mohawk river and West Canada creek. The drainage area of West Canada creek, above its junction with the Mohawk river, is 583 square miles and the drainage area of the Mohawk, above the same point, is about 712 square miles.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Herkimer, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	384.68	379.98	378.28	382.30	381.33	378.53	379.78	380.0	378.9	380.6	379.6	379.5
2	387.53	379.73	378.38	380.10	381.03	378.43	380.08	380.4	379.0	379.7	379.2	379.4
3	387.33	379.78	378.58	379.55	379.88	378.33	379.93	380.3	379.3	379.4	380.9	379.2
4	388.88	379.73	378.78	379.45	380.53	379.08	379.08	379.6	380.1	381.4	382.4	378.9
5	388.53	379.58	379.03	379.40	381.08	378.48	378.78	379.3	380.8	382.2	381.9	378.8
6	386.73	379.33	378.93	379.40	380.08	379.73	378.73	379.4	379.9	381.2	380.3	378.7
7	385.23	379.23	378.78	379.20	379.88	381.48	378.68	379.2	379.5	380.6	384.7	378.6
8	384.18	379.13	378.68	379.15	379.83	380.33	378.63	379.1	379.4	382.7	384.7	378.5
9	383.33	378.98	378.58	379.35	379.63	379.38	378.68	379.1	379.3	383.2	385.7	378.8
10	382.48	378.93	378.43	379.40	379.78	379.03	378.73	379.0	379.3	383.0	384.1	383.3
11	380.68	378.83	378.48	379.65	379.78	378.83	378.83	378.9	381.3	381.5	382.0	383.4
12	379.88	378.73	378.53	380.15	380.73	378.73	379.33	378.9	383.1	381.1	380.6	383.3
13	379.23	378.83	378.83	380.20	379.73	378.58	379.63	378.9	381.5	380.6	380.0	383.0
14	379.63	378.63	381.18	380.45	379.13	378.53	379.28	380.0	379.9	380.3	379.9	380.6
15	379.78	378.68	383.58	380.10	378.88	378.48	379.08	378.9	379.4	379.8	379.7	379.4
16	379.33	378.73	388.98	379.30	378.88	378.63	378.83	378.9	379.2	379.5	379.5	379.9
17	378.98	378.73	383.98	379.20	379.13	378.53	379.28	379.1	379.1	379.4	379.4	379.7
18	378.98	378.63	384.33	379.40	378.98	378.48	379.78	379.1	379.1	379.2	379.3	379.4
19	378.93	378.73	383.88	379.25	379.13	378.43	379.63	378.9	379.0	379.1	379.3	379.3
20	382.08	378.63	384.33	379.05	379.03	378.43	379.38	378.9	378.9	378.9	379.3	379.2
21	381.93	378.58	383.88	379.95	378.78	378.33	379.83	379.1	379.3	379.3	379.5	379.1
22	381.33	378.93	383.88	378.85	378.58	378.28	379.83	379.0	379.7	379.3	379.8	379.1
23	381.08	378.43	384.18	378.70	378.38	378.08	379.33	379.0	379.3	379.1	379.5	380.4
24	380.78	378.38	385.03	382.25	378.33	377.98	379.28	379.0	379.7	379.0	379.4	383.5
25	380.63	378.28	385.83	382.45	378.23	377.93	380.48	379.0	379.9	378.8	379.7	384.3
26	380.53	378.23	385.08	383.20	379.18	378.23	380.93	378.9	379.8	378.8	379.5	384.9
27	380.38	378.33	384.08	383.70	380.73	378.78	380.28	379.0	379.7	378.7	379.4	383.2
28	380.48	378.43	384.23	383.50	380.48	378.68	379.58	379.1	379.5	381.4	379.6	382.8
29	380.38	......	384.83	382.50	379.58	378.58	379.33	379.1	379.6	382.8	380.6	382.7
30	380.23	......	385.53	380.60	379.13	379.13	379.33	379.0	381.0	382.5	380.4	382.4
31	380.13	......	384.38	......	378.53	......	379.33	378.9	......	380.3	......	382.0

Current-meter Discharge Measurements of Mohawk River at Herkimer, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.	Remarks.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*	
1907.							
Jan. 5	Weeks and Hibbard	10.62	......	......	......	a12,000	
Jan. 5	Weeks and Hibbard	10.46	......	358	2.04	731	First overflow to right
Jan. 5	Weeks and Hibbard	10.45	......	884	2.07	1,836	First overflow to left.
Jan. 5	Weeks and Hibbard	10.42	......	710	2.39	1,696	Second overflow to left.
Jan. 5	Weeks and Hibbard	10.62	......	1,635	4.73	7,734	
Jan. 6	Weeks and Hibbard	9.42	......	1,486	3.97	5,906	
Jan. 8	J. H. McCormick Jr,	6.60	......	1,140	4.00	4,561	
Jan. 6	Weeks and Hibbard	9.42	......	......	......	b8,306	
Jan. 9	J. H. McCormick, Jr	6.10	......	1,038	4.32	4,488	
Mar. 27	J. H. McCormick, Jr	6.50	......	1,118	4.15	4,645	
May 17	Weeks and Niles	1.90	......	567	2.12	1,201	
Aug. 8	E. F. Weeks	1.70	......	502	0.71	355	Obstructed by grass.
Aug. 9	E. C. Niles	1.70	......	528	0.52	277	Obstructed by grass.
Aug. 16	E. F. Weeks	1.60	......	495	0.57	282	Obstructed by grass.
Aug. 22	E. C. Niles	1.65	......	516	0.45	234	Obstructed by grass.
Sept. 7	E. F. Weeks	2.12	......	554	1.03	573	
Sept. 21	E. C. Niles	1.40	......	482	0.76	367	
Oct. 8	E. F. Weeks	5.95	......	1,050	3.69	3,873	
Nov. 5	E. C. Niles	4.55	......	892	3.57	3,184	

a Includes overflow.
b Includes overflow.

WEST CANADA CREEK DRAINAGE BASIN.

DESCRIPTION OF BASIN.

West Canada creek rises in West Canada lakes, in southwest-central Hamilton county, and flows southwestward, then southeastward into the Mohawk at Herkimer, N. Y.

The drainage area is shown on the Utica, Little Falls, Remsen, Wilmurt, Old Forge and Canada lakes quadrangles, U. S. Geological Survey topographic map.

There are about fifty small lakes and a few undrained ponds in the watershed of the stream. Most of these are situated near the head waters and above the gaging station, the largest single water-surface being Honnedaga lake, 1.4 square miles in extent. There is also a small amount of controllable storage, in reservoirs formed by three dams. Swamps and marshes are numerous in the region of the head waters, usually adjoining lakes and tributaries and having an extent of one-half square mile or less each.

Much of the region above Twin Rock is timber-covered. There are extensive sand areas in the central and upper drainage basins. The soil of the upper watershed is underlaid by granitic gneiss usually at or near the surface, excepting in alluvial valleys. From a point just above Twin Rock bridge and extending down-stream beyond Trenton Falls, the underlying geological formation is Trenton limestone.

Compacted snow accumulates in the woodlands in winter, often to a depth of three or four feet, and representing an inch of water for each five or six inches of snow. This melts slowly, feeding the stream in March and April, which months may show a run-off greatly exceeding the precipitation.

In order to determine the precipitation on the drainage basin of upper West Canada creek, three rainfall and snow-gage stations were established in the fall of 1905. The gages were erected by Daniel L. Mott. The observers are as follows:

Hoffmeister's.— Mrs. Augustus H. Hoffmeister.

North Lake.— George C. Paull.

Honnedaga.— A. D. Barber.

The results of gagings at a station formerly maintained on this stream at Middleville are given in the report of the State Engineer and Surveyor for 1902, Supplement, pages 145–149.

Drainage Areas of West Canada Creek.

LOCALITY.	AREA IN SQUARE MILES.	
	Place to place.	Total.
West Canada creek lakes, source to foot	17.1	17.1
West Canada lakes to Swanson dam	28.0	45.1
Swanson dam to Metcalf	38.5	83.6
Honnedaga lake, above outlet	5.4	....
Honnedaga lake, outlet	11.9	....
Honnedaga lake, total	17.3	100.9
Honnedaga lake to junction of south and north branches of West Canada creek	24.7	125.6
South Branch, West Canada creek, above Remonda	48.3	....
South branch, West Canada Creek, Remonda to mouth	12.5	....
South branch, West Canada creek, total	60.8	186.4
West Canada creek, Nobleboro, junction of north and south branches to Richards	5.5	120.1
Four Mile brook	28.2	220.1
Four Mile brook to Twin Rock bridge	35.6	255.7
Black creek, above Gray	27.9	27.9
Black creek, Gray to Pardeville branch	77.0	104.9
Black creek, Pardeville to Grant	2.0	106.9
Black creek, Grant to mouth	1.2	108.1
Black Creek, total	108.1	363.8
Twin Rock bridge to Hinckley dam site	8.5	372
Hinckley site to Prospect	2.0	374
Prospect to Trenton Falls	0.9	375
Trenton Falls to Steuben creek	6.2	381
Steuben creek	52.3	434
Steuben creek to Newport	45.8	480
Newport to Middleville	47.2	527
Middleville to Kast bridge	47.5	574
Kast bridge to mouth	8.8	583

WEST CANADA CREEK AT KAST BRIDGE, N. Y.

This gaging station, which is located on West Canada creek about four miles from its junction with the Mohawk river, was established May 15, 1905, by R. E. Horton, hydrographer, U. S. Geological Survey. The station has since been maintained by this Department.

The gage is of the weight-and-reel type and is placed in a box secured to the north railing of bridge at first panel point from east abutment. The readings are taken by measuring down from a scale in the box to the water-surface by means of an iron weight suspended by graduated tape, which is attached to the reel. The scale in box is one foot long, graduated to tenths and hundredths, with its zero at elevation 464.04. The end of weight used to locate the water-surface is 49.80 feet from zero of tape, which is graduated to feet. The elevation of bottom of weight, when zero of tape is opposite zero of scale, is, therefore, 414.24. The elevation of bench-mark on north end of bridge-seat of west abutment is 458.02.

Observations are taken twice daily by Lloyd Kast.

Discharge measurements are made from the down-stream side of the bridge, to which the gage tape is attached. The initial point for soundings is the top face of the left abutment, down-stream side. The drainage area at this point is 574 square miles, or 58 per cent greater than at Twin Rock bridge.

This portion of the basin is underlain by Hudson river and Trenton shales. The topography is moderately rolling. The soil is ordinarily rather impervious and usually under culture. The precipitation and snow storage are considerably less than in the upper part of the drainage area.

The accompanying tables show the elevation of water-surface. The table for 1906 supersedes a similar table published in the State Engineer's Report for 1906, Supplement, page 197.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of West Canada Creek at Kast Bridge, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1	......	......	......	......	......	443.07	443.47	443.51	443.42	442.79	444.56	444.54
2	......	......	......	......	......	443.01	446.34	443.29	443.02	442.84	444.86	444.12
3	......	......	......	......	......	442.99	446.91	443.14	445.49	443.24	444.36	447.79
4	......	......	......	......	......	443.01	445.69	442.99	448.91	443.34	444.26	446.34
5	......	......	......	......	......	443.91	444.64	442.81	448.72	443.12	444.22	445.24
6	......	......	......	......	......	443.37	444.11	443.04	445.84	442.89	444.59	444.69
7	......	......	......	......	......	443.61	443.67	443.64	445.01	442.84	445.32	444.24
8	......	......	......	......	......	444.21	443.17	443.24	444.44	442.84	445.06	444.14
9	......	......	......	......	......	444.11	443.27	442.91	443.86	442.82	444.64	443.82
10	......	......	......	......	......	443.61	443.27	442.84	443.79	442.79	444.16	443.74
11	......	......	......	......	......	443.47	442.97	442.79	443.42	442.69	443.99	443.24
12	......	......	......	......	......	444.01	443.01	443.01	443.62	443.79	443.86	443.32
13	......	......	......	......	......	443.67	443.09	443.41	443.52	445.72	443.82	443.54
14	......	......	......	......	......	443.14	443.47	443.07	443.42	444.44	444.02	443.32
15	......	......	......	......	443.74	443.31	443.67	443.07	443.16	443.96	443.82	442.84
16	......	......	......	......	443.47	443.27	443.29	444.41	443.12	443.96	443.69	442.84
17	......	......	......	......	443.67	443.21	443.14	444.04	442.99	443.46	443.69	442.84
18	......	......	......	......	443.41	444.61	443.41	443.37	444.96	443.52	443.56	443.02
19	......	......	......	......	443.81	444.39	443.37	443.14	445.49	445.12	443.59	443.06
20	......	......	......	......	443.61	444.77	443.99	442.87	444.64	445.24	443.46	443.16
21	......	......	......	......	443.34	445.44	443.54	442.79	444.76	444.84	442.92	443.96
22	......	......	......	......	443.51	445.39	443.14	442.79	444.04	444.44	443.14	444.92
23	......	......	......	......	443.27	444.69	443.04	442.57	443.82	444.06	443.16	444.62
24	......	......	......	......	444.11	443.97	443.01	442.54	443.46	443.82	443.36	444.12
25	......	......	......	......	443.17	443.37	442.97	442.47	443.24	443.76	443.66	443.64
26	......	......	......	......	443.01	445.59	443.04	442.27	443.12	443.64	443.66	443.54
27	......	......	......	......	443.29	445.07	442.87	442.47	443.02	443.44	443.72	443.42
28	......	......	......	......	443.39	444.79	442.71	442.31	443.02	443.29	443.54	443.32
29	......	......	......	......	443.21	443.91	442.69	442.56	442.86	443.19	445.72	444.22
30	......	......	......	......	443.24	443.81	442.79	442.66	442.92	443.14	445.72	444.49
31	......	......	......	......	443.21	......	443.97	443.16	......	443.14	......	444.19

NOTE.—This is a correction of previously published report.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of West Canada Creek at Kast Bridge, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
1	444.09	443.66	443.36	444.61	444.87	443.62	444.87	443.17	442.57	442.69	443.23	443.63
2	443.76	443.31	443.34	444.29	444.64	442.94	444.89	442.91	442.14	442.79	442.97	443.11
3	443.59	442.94	443.16	444.09	445.94	442.81	444.19	442.74	441.71	442.67	442.87	443.08
4	443.71	442.76	444.71	444.46	444.94	442.77	443.74	442.97	442.54	442.57	442.87	442.67
5	444.24	443.14	444.29	444.99	445.27	442.77	444.04	443.87	442.61	442.85	442.81	442.86
6	443.69	442.99	443.99	444.79	444.84	442.97	443.67	443.41	442.41	442.67	442.81	443.51
7	443.64	443.10	443.84	444.39	444.49	443.07	443.27	443.24	442.41	442.91	442.71	443.64
8	443.51	443.12	443.60	444.19	443.94	443.23	443.04	442.87	442.41	443.13	442.69	443.03
9	443.29	443.17	443.61	443.11	443.94	443.67	443.27	442.67	443.37	442.91	441.65	443.14
10	443.34	443.19	443.74	443.79	443.97	443.57	443.87	442.69	442.17	443.04	442.71	443.09
11	443.29	443.12	443.19	444.29	443.84	443.59	443.99	442.44	442.37	443.54	442.87	443.08
12	443.46	443.14	443.24	444.62	443.59	443.41	443.51	442.49	442.34	443.34	443.17	442.94
13	443.41	443.22	442.96	444.44	443.54	443.07	443.19	442.37	442.05	443.13	443.27	442.99
14	443.27	443.11	443.01	444.79	444.84	442.94	442.94	442.91	442.14	442.95	443.09	443.02
15	443.27	443.09	442.79	447.91	444.82	442.81	442.84	442.61	442.21	442.81	443.51	444.14
16	443.34	443.11	442.96	447.61	444.04	442.91	442.77	442.37	442.31	442.81	442.99	444.54
17	443.36	443.14	443.01	446.69	413.69	443.31	442.84	442.37	442.14	442.67	442.87	444.49
18	443.29	443.06	442.87	446.31	443.79	444.16	442.77	442.21	442.44	442.61	443.32	443.99
19	443.31	443.04	442.84	446.41	443.64	443.47	442.69	442.24	442.29	442.58	444.71	443.54
20	443.24	443.01	442.79	446.51	443.84	443.04	442.59	442.14	442.19	444.14	444.72	443.39
21	443.49	444.07	442.79	446.59	443.44	442.97	442.47	442.84	442.37	444.04	444.19	443.44
22	445.01	444.69	442.84	446.64	443.16	442.94	442.51	442.74	442.41	443.99	444.24	443.31
23	446.69	444.29	442.74	446.64	443.09	443.14	442.54	442.77	442.81	443.41	444.55	443.19
24	447.37	444.12	442.75	445.64	443.04	443.34	442.51	442.64	442.79	442.99	443.97	442.95
25	446.09	444.24	442.84	444.71	443.09	443.33	442.41	442.44	442.81	443.19	443.81	442.85
26	445.16	444.54	442.91	444.16	443.19	442.99	442.41	442.29	442.59	443.35	443.53	442.95
27	444.71	443.86	444.91	444.69	443.99	442.81	442.29	442.47	442.59	443.37	443.31	442.97
28	444.29	443.54	445.71	444.17	444.71	442.81	442.54	442.69	442.53	443.42	444.17	442.93
29	443.89	......	444.99	444.81	444.39	442.79	442.61	443.14	442.59	443.51	444.01	442.93
30	443.74	......	444.99	444.74	443.79	442.87	442.69	442.77	442.67	443.47	443.63	442.91
31	443.69	......	445.44	......	443.31	......	443.31	442.69	......	443.54	......	443.59

NOTE.—This is a correction of previously published report.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of West Canada Creek at Kast Bridge, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	445.48	446.64	444.66	445.85	446.19	443.19	443.34	442.68	442.23	444.06	443.50	443.12
2	445.39	445.93	444.94	444.99	445.71	443.14	443.63	442.99	442.14	443.37	443.50	443.25
3	445.04	445.25	445.46	444.64	444.89	443.11	444.03	443.35	442.31	*b*	444.15	443.18
4	448.39	445.35	445.70	444.39	444.59	443.04	443.86	443.22	443.25	*b*	445.35	442.83
5	446.70	445.06	445.12	444.44	444.68	442.91	442.98	442.87	444.27	*b*	444.64	442.48
6	445.62	445.23	444.40	444.76	444.42	444.09	442.79	443.74	443.59	*b*	444.23	442.91
7	445.24	444.79	443.92	444.46	444.38	444.73	442.68	442.70	443.22	*b*	446.49	442.99
8	445.40	444.69	443.79	443.94	444.22	444.19	442.52	442.71	443.01	446.08	446.72	442.94
9	445.12	444.48	443.76	444.02	444.19	443.34	442.61	442.67	442.89	446.48	445.26	443.06
10	444.21	444.68	443.62	443.67	443.99	443.08	443.49	442.63	443.06	445.18	444.46	446.43
11	444.22	444.81	443.73	443.80	444.04	443.14	442.35	442.47	444.79	444.32	444.00	446.84
12	443.82	444.37	443.58	444.12	443.84	443.34	442.78	442.30	445.63	444.79	443.80	445.36
13	443.60	444.33	443.64	444.22	443.73	443.03	442.81	442.57	444.86	444.45	443.62	444.42
14	443.60	444.65	444.84	443.86	443.69	442.83	442.81	443.32	443.83	444 19	443.39	444.32
15	443.52	444.49	445.49	443.66	443.72	442.88	442.71	442.64	443.21	443.79	443.26	443.86
16	442.96	444.66	445.29	443.48	443.49	441.89	442.56	442.34	443.68	443.72	*b*	443.83
17	442.74	444.41	445.37	443.40	443.46	442.81	442.74	442.46	443.04	443.38	*b*	443.66
18	442.89	445.59	446.44	443.42	443.46	442.66	442.81	442.24	442.89	443.35	*b*	443.56
19	442.86	444.75	*b*	443.29	443.57	442.65	442.89	442.84	442.86	443.23	*b*	443.44
20	445.37	444.97	*b*	443.24	443.33	442.56	442.69	442.49	442.79	443.27	*b*	443.25
21	444.06	444.62	*b*	443.14	443.26	442.63	442.65	442.44	443.02	443.22	*b*	443.30
22	443.74	444.41	445.02	443.09	443.56	442.51	442.53	442.37	443.03	443.11	443.52	443.21
23	443.16	444.49	446.09	443.16	443.07	442.51	442.64	442.31	442.9)	443.02	443.36	444.28
24	443.08	444.38	446.00	445.02	443.19	442.39	443.24	442.49	443.15	442.98	443.20	446.00
25	443.00	444.64	445.02	445.49	443.19	442.56	443.14	442.43	443.38	442.89	443.39	445.80
26	446.02	445.21	445.04	446.49	443.39	442.61	442.94	443.06	443.50	442.70	443.26	445.08
27	*b*	444.82	445.46	446.37	443.73	442.61	443.16	442.29	443.42	442.71	443.22	444.40
28	*b*	444.49	446.62	445.64	443.66	442.68	442.89	442.37	443.23	445.46	443.27	445.06
29	*b*	......	447.52	445.52	443.63	442.64	442.64	442.37	443.38	445.49	443.54	444.84
30	*b*	......	447.52	445.51	443.39	442.85	442.64	442.26	444.20	444.40	443.38	444.34
31	*b*	......	447.10	......	443.24	......	442.51	442.29	......	443.83	......	445.31

b No record.

Current-meter Discharge Measurements of West Canada Creek at Kast Bridge, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
Mar. 28..	McCormick and Strong.......	32.29	......	1,071	6.35	6,814
April 2..	McCormick and Niles........	30.59	......	734	4.02	2,942
April 5..	McCormick and Niles........	30.08	......	640	3.48	2,224
July 18..	Weeks and Niles............	28.52	......	343	1.47	504
Aug. 9..	E. C. Niles................	28.43	......	324	1.34	436
Aug. 9..	E. F. Weeks................	28.48	......	334	1.45	485
Aug. 15..	E. F. Weeks................	28.39	......	317	1.37	438
Aug. 22..	E. C. Niles................	28.14	......	374	1.02	280
Aug. 29..	Horton and Weeks..........	28.07	......	260	0.98	253
Sept. 2..	Horton and Weeks..........	27.92	......	252	0.85	214
Sept. 20..	E. C. Niles................	28.56	......	351	1.54	539
Oct. 25..	E. C. Niles................	28.86	......	400	1.72	688

Mean Daily Discharge, Second-feet, of West Canada Creek at Kast Bridge, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	4,875	8,860 *a*	2,832 *a*	6,025	7,130	804	942	446	234	1,805	1,095	752
2	4,585	6,195	3,442	3,560	5,528	767	1,248	658	200	968	1,095	840
3	3,678	4,150	4,802	2,786	3,324	745	1,770	942	271	*b*	1,910	797
4	18,680	4,440	5,455	2,326	2,694	694	1,525	826	840	*b*	4,440	541
5	9,055	3,737	3,855	2,418	2,878	599	651	570	2,096	*b*	2,786	351
6	5,238	3,383	2,326	3,029	2,372	1,840	511	475	1,197	*b*	2,050	599
7	4,150	3,088	1,595	2,464	2,326	2,970	446	456	826	*b*	8,275	658
8	4,585	2,878	1,420	1,630	2,015	1,980	370	461	672	6,790	9,152	621
9	3,619	2,510	1,385	1,735	1,980	942	414	442	584	8,275	4,222	708
10	2,015	2,878	1,222	1,274	1,700	723	356	423	708	4,032	2,464	8,080
11	2,015	3,147	1,350	1,420	1,770	767	290	347	3,088	2,188	1,700	9,720
12	1,455	2,280	1,197	1,875	1,490	942	504	267	5,310	3,088	1,420	4,512
13	1,197	2,234	1,248	2,015	1,350	687	526	394	3,265	2,418	1,222	2,372
14	1,197	2,786	3,206	1,525	1,299	541	526	916	1,490	1,980	993	2,188
15	1,120	2,510	4,875 *a*	1,274	1,324	577	461	428	818	1,420	866	1,525
16	636 *a*	2,832	4,295 *a*	1,095	1,095	1,044	390	285	1,299	1,324	*b*	1,490
17	475 *a*	2,372	4,512 *a*	993	1,070	526	475	342	694	993	*b*	1,274
18	584 *a*	*a*	8,080 *a*	1,018	1,070	437	526	238	584	942	*b*	1,172
19	562 *a*	2,970	*a*	891	1,172	433	584	118	562	833	*b*	1,044
20	*a*	3,501	*a*	840	942	390	451	356	511	866	*b*	840
21	1,805 *a*	2,740	*a*	767	866	423	433	333	680	826	*b*	891
22	1,350	2,372	*a*	730	1,172	366	375	299	687	745	1,120	826
23	782 *a*	2,510	6,790	782	716	366	428	271	591	680	968	2,142
24	723 *a*	2,326	6,450	3,619	804	309	840	356	774	651	811	6,450
25	665 *a*	2,786	3,619	4,875	804	390	767	328	993	584	993	5,770
26	*a*	4,091	3,678	8,275	993	414	621	708	1,095	456	866	3,796
27	*b*	3,147	4,802	7,788	1,350	414	782	262	1,018	461	826	2,326
28	*b*	2,510	8,762	5,310	1,274	446	584	299	833	4,802	866	3,737
29	*b*	....	13,140	4,948	1,248	428	428	276	993	4,875	1,146	3,206
30	*b*	....	13,140	4,948	993	555	428	248	1,980	2,326	993	2,234
31	*b*	....	10,895	......	840	......	366	262	......	1,490	......	4,368
Mean	3,127	3,305	4,755	2,741	1,793	751	613	420	1,163	2,147	2,178	2,446

a Ice obstruction.
b No record.

Monthly Discharge of West Canada Creek at Kast Bridge, N. Y.

[Drainage area, 574 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January (24 days)*a*	18,680	475	3,127	5.45	6.27
February	....	....	....	....	....
March	....	....	....	....	....
April	8,275	730	2,741	4.77	5.34
May	7,130	716	1,793	3.12	3.59
June	2,970	309	751	1.31	1.47
July	1,770	290	613	1.07	1.23
August	942	118	420	0.73	0.84
September	5,310	200	1,163	2.02	2.26
October	8,275	456	2,147	3.74	4.30
November (26 days)	9,152	811	2,178	3.79	4.24
December (25 days)	9,720	351	2,446	4.25	4.89

a Days ice obstruction.

WEST CANADA CREEK ABOVE MORGAN DAM, TRENTON FALLS, N.Y.

A gage was established February 8, 1904, by E. A. Lamb on the right-hand bank of West Canada creek about 100 feet up-stream from Morgan dam. The gage is attached to a large cedar tree and consists of a vertical board with painted tenth-foot stripes and reads from zero to 14 feet. The gage is located about 1,200 feet down-stream from the power-plant of the Utica Gas & Electric Co., at Trenton Falls. Its zero mark is at elevation 751.03. Readings are taken each morning and night by C. W. Young. The gage is maintained by this Department in coöperation with the U. S. Weather Bureau.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of West Canada Creek above Morgan Dam, Trenton Falls, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	755.1	753.4	753.4	756.7	756.6	753.8	753.6	753.2	753.1	754.4	754.2	753.6
2	755.4	753.4	753.5	756.5	755.8	753.6	754.6	753.3	753.2	753.8	754.1	753.6
3	754.9	753.5	753.5	755.5	755.6	753.6	754.7	754.0	753.2	753.7	755.1	753.6
4	755.6	753.5	753.6	755.0	755.3	753.6	753.8	753.8	753.7	754.5	755.6	753.5
5	756.6	753.6	753.7	754.9	755.2	753.7	753.5	753.5	754.5	755.0	755.1	753.5
6	755.6	753.7	753.6	755.2	755.3	754.6	753.5	753.3	753.9	754.6	754.8	753.5
7	755.3	753.5	753.5	754.8	754.9	755.1	753.5	753.4	753.7	754.3	756.0	753.4
8	755.1	753.5	753.4	754.8	754.7	754.3	753.4	753.6	753.7	755.8	756.2	753.5
9	755.0	753.5	753.4	754.2	754.5	753.9	753.3	753.4	753.5	756.2	755.6	753.6
10	754.4	753.5	753.4	754.2	754.7	753.8	753.3	753.3	753.8	755.1	754.8	755.1
11	754.3	753.4	753.4	754.1	754.4	754.0	753.3	753.2	754.1	754.8	754.5	756.5
12	754.2	753.4	753.4	754.4	754.2	753.8	753.4	753.3	755.6	755.1	754.5	755.5
13	754.2	753.5	753.4	754.3	754.2	753.8	753.7	754.1	754.6	754.7	754.2	754.7
14	754.2	753.4	753.5	754.1	754.2	753.6	753.4	754.3	754.1	754.6	754.1	754.5
15	754.0	753.4	753.6	754.0	754.5	754.5	753.4	753.4	754.3	754.3	754.0	754.0
16	753.9	753.4	753.8	753.9	753.7	753.7	753.2	753.3	754.1	754.1	753.9	753.9
17	753.9	753.4	753.9	753.9	754.1	753.5	753.3	753.2	753.7	754.0	753.8	753.9
18	754.0	753.4	753.9	753.7	754.1	753.5	753.5	753.2	753.6	753.9	753.8	753.9
19	753.9	753.3	754.0	753.7	753.9	753.5	753.5	753.2	753.6	753.8	753.8	753.8
20	754.3	753.4	753.9	753.7	753.8	753.4	753.5	753.2	753.5	753.6	754.0	753.7
21	754.3	753.4	754.0	753.6	754.7	753.3	753.4	753.1	753.6	753.6	754.1	753.7
22	754.2	753.4	754.2	753.6	753.8	753.4	753.4	753.1	753.6	753.6	754.0	753.7
23	754.0	753.3	754.5	753.8	753.7	753.3	753.9	753.1	753.5	753.6	753.9	753.9
24	754.0	753.4	755.0	755.6	753.8	753.4	753.8	753.1	753.6	753.6	753.9	755.7
25	753.9	753.4	754.8	755.6	753.8	753.4	753.4	753.1	754.1	753.5	753.8	755.4
26	753.9	753.4	754.8	756.2	753.8	753.3	753.5	753.1	*a*	753.5	753.8	754.9
27	753.8	753.4	755.0	756.2	754.1	753.3	753.7	753.1	*a*	753.5	753.8	754.5
28	753.8	753.4	756.4	755.8	754.2	753.5	753.6	753.1	*a*	755.5	753.7	754.6
29	753.6	....	757.2	755.9	754.0	753.4	753.5	753.1	*a*	755.7	753.7	754.6
30	753.5	....	757.2	755.7	753.9	753.4	753.4	753.1	*a*	754.8	753.7	754.8
31	753.5	....	756.7	....	753.9	....	753.3	753.1	.....	754.5	......	755.1

a No record.

WEST CANADA CREEK AT TRENTON FALLS, N. Y.

This gaging station, which is located at the dam of the Utica Gas and Electric Co., was established October 17, 1905, by C. A. Poole. The gage board is secured to face of dam in a vertical position and is placed above the water-surface, the readings being taken by means of chain and plumb-bob passing on pulley over top of gage. The observations are taken by placing plumb-bob at water-surface and reading the gage at a point marked on chain ten feet above plumb-bob. The elevation of zero of gage is 1,009.56, to which all readings are added. The gage is graduated in feet and inches and is read twice each day by C. W. Young.

The dam is of concrete with masonry coping and has a spillway 97.9 feet long. Another spillway or by-pass two feet lower than crest or main spillway allows the water to pass through a rock channel on east side of dam. The crest of this lower spillway is 163.4 feet long at an elevation of 1,017.12. The discharge over the two spillways has been calculated by means of the weir formula, using coefficients derived from the United States Geological Survey experiments.

The discharge diverted by the Power Company has been computed from diagrams expressing the flow as a function of the kilowatts used. These diagrams were made from tests made by the Power Company to determine the discharging capacity of the turbines, which are of a special design. These tests were made by computing the discharge over weirs placed in the tail-race.

A daily record is kept of the total kilowatts used in twenty-four hours, also the number of hours every day each turbine runs, there being four turbines in all.

The mean discharge has been calculated from each observation taken at the gage, thereby giving a mean for twelve hours, and the maximum and minimum discharges given in the accompanying table are, therefore, means for twelve hours and do not represent the highest or lowest flow of short duration.

The pondage above the Trenton falls dam is very limited and the operation of the generators during low water has to be adjusted according to the conditions of inflow. The inflow is controlled by pondage above Hinckley dam. Owing to irregularity of operation during low water, the Trenton falls record is considered approximate only, for the low-water period.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of West Canada Creek above Trenton Falls Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1.....	1,020.81	1,018.56	1,017.18	1,020.44	1,021.39	1,017.81	1,019.60	1,008.14	*a*	1,020.14	1,019.89	1,019.27
2.....	1,020.94	1,018.93	1,017.68	1,019.60	1,020.39	1,017.81	1,020.39	1,011.98	1,014.44	1,019.52	1,019.81	1,018.89
3.....	1,020.44	1,019.72	1,019.14	1,019.35	1,019.89	1,017.64	1,019.97	1,019.89	1,015.14	1,019.39	1,020.94	1,018.56
4.....	1,021.35	1,018.23	1,018.56	1,018.94	1,019.77	1,017.52	1,019.68	1,019.68	1,019.72	1,020.31	1,021.40	1,013.64
5.....	1,021.72	1,018.10	1,018.10	1,019.36	1,019.77	1,017.56	1,014.35	1,018.89	1,020.23	1,020.68	1,020.77	1,016.85
6.....	1,021.14	1,018.03	1,017.77	1,019.36	1,019.64	1,018.89	1,019.31	1,014.56	1,019.72	1,020.39	1,020.73	1,018.06
7.....	1,020.52	1,018.14	1,017.31	1,019.27	1,019.31	1,019.52	1,019.31	1,017.23	1,019.48	1,020.06	1,021.73	1,018.14
8.....	1,020.60	1,018.31	1,017.52	1,018.90	1,019.31	1,018.60	1,017.39	1,018.18	1,019.60	1,021.48	1,021.85	1,019.27
9.....	1,020.56	1,018.39	1,017.52	1,018.44	1,018.93	1,019.10	1,014.93	1,017.23	1,019.23	1,022.10	1,021.02	1,018.35
10.....	1,020.02	1,018.98	1,018.44	1,018 31	1,019.18	1,017.77	1,010.60	1,015.35	1,019.60	1,020.89	1,021.39	1,020.60
11.....	1,019.98	1,017.98	1,017.35	1,018.27	1,018.89	1,018.39	1,015.22	1,017.31	1,019.81	1,020.44	1,019.94	1,021.92
12.....	1,019.60	1,018.39	1,017.77	1,018.72	1,018.39	1,017.72	1,013.81	1,016.48	1,021.60	1,020.77	1,019.73	1,020.78
13.....	1,019.72	1,018.01	1,017.98	1,018.68	1,018.35	1,017.60	1,019.52	1,014.76	1,020.77	1,020.56	1,019.10	1,019.85
14.....	1,019.48	1,017.01	1,018.02	1,018.60	1,018.27	1,017.48	1,019.31	1,019.31	1,019.89	1,020.18	1,019.44	1,019.72
15 . .	1,019.40	1,017.89	1,018.48	1,018.14	1,018.81	1,018.14	1,018.02	1,016.85	1,019.98	1,019.94	1,019.31	1,019.93
16... .	1,018.98	1,018.01	1,019.18	1,017.90	1,017.77	1,017.38	1,014.06	1,014.39	1,019.68	1,019.84	1,019.27	1,019.60
17.....	1,018.10	1,019.81	1,018.72	1,017.89	1,018.14	1,017.31	1,010.14	1,010.10	1,019.44	1,019.68	1,019.48	1,019.35
18... .	1,018.60	1,018.02	1,018.14	1,017.77	1,018.06	1,016.31	1,019.31	1,013.98	1,019.27	1,019.60	1,019.31	1,019.27
19... .	1,019.56	1,017.72	1,017.98	1,017.68	1,018.06	1,014.64	1,018.98	1,016.68	1,018.64	1,019.52	1,019.27	1,019.18
20.....	1,020.10	1,018.18	1,018.14	1,017.68	1,017.89	1,011.77	1,019.10	1,004.31	1,017.10	1,019.56	1,019.35	1,018.98
21.....	1,019.89	1,017.73	1,018.14	1,017.94	1,019.85	1,012.68	1,019.18	1,009.56	1,018.52	1,019.48	1,019.60	1,018.98
22.....	1,019.93	1,017.64	1,018.14	1,017.68	1,017.77	1,016.85	1,017.51	1,011.26	1,019.44	1,019.39	1,019.35	1,019.31
23.....	1,019.60	1,018.43	1,018.98	1,017.90	1,017.68	1,019.48	1,019.10	1,014.56	1,019.10	1,019.39	1,019.31	1,019.35
24.....	1,019.26	1,018.31	1,019.48	1,020.10	1,017.62	1,016.51	1,018.68	1,014.31	1,019.44	1,019.35	1,019.39	1,021.02
25. . .	1,019.31	1,017.73	1,019.31	1,020.02	1,017.89	1,016.52	1,018.14	1,014.89	1,019.72	1,019.31	1,019.27	1,020.98
26.....	1,019.40	1,017.77	1,019.26	1,020.85	1,017.93	1,012.76	1,019.31	1,012.72	*a*	1,019.31	1,019.27	1,020.27
27.....	1,019.93	1,017.18	1,019.44	1,020.98	1,018.14	1,015.39	1,019.56	1,010.52	*a*	1,019.31	1,019.23	1,019.85
28.....	1,019.10	1,017.23	1,020.81	1,020.60	1,018.52	1,018.85	1,019.47	1,003.65	*a*	1,021.14	1,019.39	1,019.93
29.....	1,018.93	....	1,022.10	1,020.52	1,018.02	1,018.97	1,018.10	1,000.73	*a*	1,021.39	1,019.35	1,020.06
30.....	1,018.72	....	1,022.35	1,020.31	1,018.06	1,019.39	1,012.14	999.81	*a*	1,020.52	1,019.31	1,020.06
31.....	1,018.10	....	1,021.77	......	1,017.89	......	1,009.60	998.77	....	1,020.10	....	1,020.85

a No record.

Mean Daily Discharge, Second-feet, of West Canada Creek at Trenton Falls, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1....................	2,302	340	219	3,942	6,227	470	569	211	*a*	1,210	914	267
2....................	2,649	371	224	2,406	3,831	402	1,716	223	220	523	811	263
3....................	1,801	743	265	2,035	2,923	427	979	867	244	460	2,318	278
4....................	3,594	283	331	1,507	2,658	374	556	545	698	1,576	3,349	288
5....................	4,464	277	291	2,048	2,571	387	438	265	1,303	2,001	2,163	293
6....................	2,928	265	261	2,042	2,685	1,448	404	269	707	1,354	2,104	283
7....................	1,923	269	225	1,816	2,068	2,273	286	272	416	1,029	4,100	270
8....................	2,066	251	229	1,474	2,173	1,134	266	336	424	3,783	4,346	266
9....................	1,995	286	224	1,001	1,537	1,601	207	273	349	4,919	2,600	282
10....................	1,194	266	193	884	2,073	504	187	251	572	1,384	3,201	2,125
11....................	1,144	226	229	854	1,538	960	204	218	797	1,636	956	4,533
12....................	721	281	223	1,259	861	476	259	213	3,763	2,122	729	2,169
13....................	749	221	231	1,217	922	408	474	1,095	2,152	1,634	1,251	876
14....................	597	214	285	1,057	852	359	172	404	873	1,277	485	720
15....................	552	245	322	755	1,402	737	682	212	848	960	413	803
16....................	378	262	408	590	500	201	270	198	666	865	385	595
17....................	310	821	246	583	757	298	229	180	469	689	355	438
18....................	379	269	294	511	685	250	392	81	384	600	369	303
19....................	672	261	646	455	601	252	312	204	300	521	397	348
20	1,199	311	761	443	572	258	288	186	280	368	435	282
21....................	1,040	262	766	520	1,760	250	197	156	346	509	861	267
22....................	1,088	243	765	446	502	202	384	195	329	467	430	266
23....................	730	256	1,619	585	449	360	1,720	155	291	472	389	432
24....................	484	157	2,120	3,621	475	256	337	158	458	448	440	2,601
25....................	515	218	1,975	3,107	575	255	267	143	686	426	387	2,383
26....................	558	222	1,870	4,869	515	218	399	159	*a*	412	393	2,375
27....................	983	226	2,163	5,162	755	218	501	135	*a*	239	365	835
28....................	388	222	4,812	4,185	1,075	275	366	187	*a*	2,896	364	929
29....................	379	......	8,268	4,105	668	202	746	157	*a*	3,358	415	938
30....................	359	......	9,433	3,664	637	297	281	163	*a*	1,766	391	1,096
31....................	317	......	7,193	......	574	......	205	147	......	1,156	......	2,263
Mean...............	1,240	295	1,519	1,905	1,465	525	461	266	714	1,324	1,204	970

a No record.

Monthly Discharge of West Canada Creek at Trenton Falls, N. Y.
[Drainage area, 375 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	4,464	310	1,240	3.31	3.81
February	821	157	295	0.79	0.822
March	9,433	193	1,519	4.06	4.67
April	5,162	443	1,905	5.09	5.70
May	6,227	449	1,465	3.91	4.50
June	2,273	201	525	1.40	1.57
July	1,720	172	461	1.23	1.41
August	1,095	81	266	0.71	0.82
September (25 days)	3,763	220	714	1.91	2.14
October	4,919	239	1,324	3.54	4.07
November	4,346	355	1,204	3.21	3.60
December	4,533	263	970	2.59	2.98

WEST CANADA CREEK AT TWIN ROCK BRIDGE.

A current-meter gaging station was established at Twin Rock bridge, September 7, 1900, by Robert E. Horton, for the U. S. Geological Survey, by which it has since been maintained in coöperation with this Department. The bridge is 167.5 feet long between abutments, and consists of two spans. The bed is of gravel and cobble, and the entire flow passes underneath at all stages. In the winter the stream becomes completely ice-covered, requiring special discharge measurements. The gage is read each morning and evening by Frank McArthur, and the record is furnished by the Consolidated Water Co. of Utica, N. Y.

The readings are taken from a gage of special design equipped with a phosphor-bronze tape, attached to the up-stream side of the bridge. When the stream is obstructed by logs, the discharge is determined from special measurements. During 1907 a series of low-water measurements was made by boat at a cross-section 50 feet up-stream from the bridge.

Current-meter Discharge Measurements of West Canada Creek at Twin Rock Bridge.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
Mar. 1..	C. C. Covert	28.70	*a*	340	0.80	273
April 3..	Horton, Niles and McCormick	31.35	......	821	......	2,296
April 12..	E. C. Niles	30.58	......	787	......	1,667
May 18..	Weeks and Niles	29.77	......	501	......	835
Aug. 9..	E. F. Weeks	28.72	......	......	......	298*b*
Aug. 15..	E. F. Weeks	28.30	......	......	......	224*b*
Aug. 19..	E. F. Weeks	28.30	......	......	......	210*b*
Aug. 22..	E. F. Weeks	28.28	......	419	......	183*c*
Aug. 26..	E. F. Weeks	28.25	......	427	......	163*c*
Aug. 29..	E. F. Weeks	28.29	......	419	......	176*c*
Sept. 3..	E. F. Weeks	28.47	......	449	......	231*c*
Sept. 6..	E. F. Weeks	29.63	......	620	......	682*c*
Sept. 26..	E. F. Weeks	30.24	......	570	......	980*c*
Oct. 5..	Weeks and Quinn	31.50	......	931	......	1,887*c*
Oct. 1..	Weeks and Niles	30.72	......	663	......	1,289*c*

a Ice, average thickness, 1.26 feet. Gage reading to under surface of ice.

b Twin Rock gaging section obstructed by logs: West Canada creek measured at Northville, and Black creek measured 1½ miles above Grant.

c Measured by boat 50 feet up-stream from Twin Rock bridge.

Mean Daily Discharge, Second-feet, of West Canada Creek at Twin Rock Bridge.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	3,319	560	......	4,813	6,470	608	777	207	186	1,210	1,010	......
2	5,255	598	237	3,039	4,349	598	1,490	334	176	628	942	......
3	3,433	772	330	2,503	2,685	547	1,053	838	222	603	1,769	......
4	4,876	731	407	2,031	2,105	476	705	578	838	1,689	3,520	......
5	9,056	458	373	2,199	2,477	456	532	357	1,239	2,097	2,850	......
6	6,055	492	305	2,555	1,959	1,245	396	289	737	1,510	2,265	......
7	4,137	492	237	2,154	1,626	1,262	396	348	585	1,310	4,600	......
8	3,319	656	254	1,337	1,479	1,210	308	354	567	4,225	3,160	......
9	4,137	526	237	1,458	1,437	632	238	260	567	4,900	1,850	......
10	1,863	560	220	1,106	1,222	608	222	235	741	2,716	1,828	......
11	1,090	492	213	1,222	1,222	656	219	281	973	1,828	1,379	......
12	858	424	199	1,773	1,222	608	328	253	3,950	2,271	1,106	......
13	904	424	228	1,479	1,260	527	588	620	1,682	1,828	952	......
14	712	458	216	1,106	1,318	456	517	400	1,010	1,438	822	......
15	636	458	364	988	1,337	425	342	222	1,280	1,111	753	......
16	560	356	500	845	651	547	238	180	814	932	705	......
17	560	390	543	808	1,182	415	308	196	644	790	699	......
18	674	356	492	737	741	317	517	180	608	699	620	......
19	712	322	475	684	717	300	314	185	557	614	598	......
20	904	322	419	651	644	284	284	196	527	626	802	......
21	1,158	288	492	684	578	292	383	191	588	650	822	......
22	1,090	254	526	668	555	251	342	168	581	547	668	......
23	1,042	220	783	826	557	308	624	165	435	514	705	......
24	810	254	1,392	2,175	598	386	405	172	527	517	681	......
25	904	220	1,262	3,839	598	238	342	168	818	469	628	......
26	598	220	1,201	5,586	466	224	547	154	966	456	591	......
27	636	220	1,262	5,548	802	259	517	165	781	517	585	......
28	560	220	2,40[illegible]	4,319	896	425	456	183	640	3,300	557	......
29	560	......	11,720	3,868	662	[illegible]	326	176	777	3,600	603	......
30	636	......	9,097	4,046	681	292	251	182	1,682	1,878	557	......
31	492	......	8,212	......	632	......	210	176	......	1,262	......	......
Mean	1,986	419	1,391	2,168	1,397	511	458	271	857	1,508	1,288	......

Monthly Discharge of West Canada Creek at Twin Rock Bridge.

[Drainage area, 364 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	9,056	492	1,986	5.46	6.28
February	772	220	419	1.15	1.20
March (30 days)	11,720	199	1,491	4.13	4.62
April	5,580	651	2,168	5.96	6.68
May	6,470	466	1,397	3.84	4.42
June	1,262	224	511	1.38	1.57
July	1,490	210	458	1.26	1.45
August	838	154	271	0.745	0.857
September	3,950	176	857	2.35	2.63
October	4,900	514	1,508	4.14	4.76
November	4,600	557	1,288	3.54	3.96
December	8,766	478	3,820	10.50	12.08

PRECIPITATION IN UPPER WEST CANADA CREEK DRAINAGE BASIN.

Standard U. S. Weather Bureau rain gages were erected in November, 1905, at North lake, Honnedaga and Hoffmeister. The resulting observations are tabulated in the accompanying tables. The records at North lake are taken by Geo. C. Paull. North lake is located just outside of the West Canada creek watershed line. The observations at Honnedaga are taken by A. D. Barber; those at Hoffmeister are taken by Mrs. Augustus Hoffmeister.

Arrangements have been made to obtain a record of the depth of snow accumulation and of the water equivalent of the snow on ground at each of these stations.

No record was obtained at Honnedaga during 1907.

Precipitation at North Lake, near Atwell, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1.2	0.5*			0.72			0.25				
2							0.78	0.11				
3	1.15								0.25	1.0	1.1	
4					0.78				0.31			
5		0.3*		0.18	0.1	0.82			1.85			
6					0.1	0.7		0.2	0.71		0.45	
7	0.6*				0.3					0.41	1.0	
8	0.5									1.59	0.3*	
9									0.35			0.9*
10				0.4	0.5*				1.55			1.83
11	0.15*									0.7		
12							0.85			0.15		
13												
14		0.5*	0.1								0.1*	
15												0.5*
16					0.98		0.85		0.1			
17												
18	1.0*											
19					0.2							
20									0.18			
21			0.02*						0.32		0.35	
22	0.15*	0.5*										
23			0.5						1.0			1.5
24				0.92			1.05		0.16			
25				1.04	0.55						0.5*	
26	0.1*			0.5		0.82	0.55				0.3*	
27			0.2	0.32	0.3	0.36				0.6		{0.5* 0.25
28	0.1*	0.4*								0.95		
29	0.3*								0.68			0.75
30	0.2*					1.0					0.1*	
31												

*Snow.

Mean Daily Precipitation near Hoffmeister, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	T*	T*		T*			1.13	0.77				0.1*
2		T*	} 1.0*	{		T	T	1.19	0.3		1.38	0.05*
3	1.83	0.68*	{	{	0.47				0.68		0.27	T*
4	T*		} 0.04*	{	0.03	T			1.6	1.16		
5		0.1*		{ 0.17		1.5		0.23	0.07	0.13	0.05	
6					0.05	0.22	T	T	0.06	0.3	1.6	
7	0.49				0.34	T		0.43	0.11	} 1.82	{ T*	
8	0.13		T*	0.33*	0.04		0.09		0.06		{	
9	T*				0.05				0.65			
10	T*	0.35*		0.07	0.2*	0.06			0.04	} 0.88	{ T	1.8
11					T*		} 1.28	{	1.19		{ T*	T*
12	0.49*		} 0.96*	{ T*				{	0.06	T		T*
13		T*		{ 0.1*							T*	
14	0.2	0.08*				0.13					T*	1.2*
15	T*	T*	T*	T*	0.2							0.12*
16	T*	0.3*		0.25*	0.11		T	0.32	0.05			0.22*
17			T	T*			0.27					0.1*
18	T			T*	T		T		T	0.05		0.08*
19	0.5	0.56*		T*	0.24	T			0.02			0.03*
20	T*				T	T	0.54		0.3	0.37*		
21	0.13*	T*						0.13			0.35	T*
22		T*					0.3					
23	0.07*			1.07					0.33			1.3
24		} 0.39*	{ T*			0.13	0.26	0.07	} 0.65	{		
25	} 0.27*	{	{	0.97		0.2	0.67	T		T*	0.73*	0.5*
26		{		0.25	0.68	1.48	0.03		T		} 0.54*	{
27			} 1.11	{	0.29	0.22		0.21		1.64		{ 0.22
28	} 0.13*	{ T*		{	T*				} 0.97	{ 0.13	0.28*	0.1
29		{	0.04	T		} 1.36	{ 0.07			T*		
30				0.91			{	T	0.3			0.73
31							0.06					T*

*Snow. T means trace.

MOHAWK RIVER AT UTICA, N. Y.

A current-meter gaging station was formerly maintained at the Genesee street bridge in Utica, by R. E. Horton, hydrographer, U. S. Geological Survey, but was discontinued May 1, 1903, owing to changes in the channel, due to the river straightening work begun by the city of Utica. A description of the drainage area of the Mohawk river above Utica, and a record of the discharge for several months at this station are given in the Supplement to the Report of the State Engineer and Surveyor for 1903.

The present gaging station is located at the bridge on the Black River branch of the N. Y. C. & H. R. R. R., crossing the river about three-quarters of a mile west of Genesee street. It was established March 31, 1905, by C. A. Poole, in coöperation with the U. S. Weather Bureau. The gage is a vertical board, graduated in feet and tenths, and is secured to the southeast wing of the south abutment of the bridge, with its zero mark at elevation 394.81. Observations of the stage of the stream are taken twice each day under the direction of J. B. Mahoney, Superintendent of the Utica Division of the Hudson River Electric Power Co.

This station was established originally for the purpose of obtaining a record of the fluctuation of the water-surface in that vicinity, and has been maintained for that purpose principally. Several current-meter measurements, however, have been made, from which the discharge has been calculated for the different stages of the river at the time of measurement. The location is not favorable, however, for meter measurements, the flow of the stream being sluggish, especially during low water, and the adjacent flats are overflowed during flood stages.

Current-meter Discharge Measurements of Mohawk River at Black River R. R. Bridge, Utica N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
Mar. 27..	McCormick and Cruger.......	8.12	......	1,490	2 40	3,575
April 4..	McCormick and Niles	3.10	......	1,124	0 83	933
April 9..	R. E. Horton and E. C. Niles..	3 05	......	1,175	0.69	814
June 12..	R. E. Horton and E. C. Niles..	1.00	......	929	0.25	234

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Black River R. R. Bridge, Utica, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	405.0	397.8	397.2	400.2	398.0	396.6	398.5	397.6	396.6	398.3	398.9	398.8
2	404.3	397.4	397.2	398.1	397.7	396.3	399.4	397.4	396.8	397.8	398.4	398.7
3	401.8	397.4	397.2	398.2	397.9	395.9	398.4	397.0	396.9	397.8	399.1	398.6
4	....	397.4	397.1	397.9	398.3	395.8	398.1	396.9	397.1	399.0	402.6	398.6
5	....	397.4	396.9	397.8	399.8	395.8	397.7	396.8	397.0	400.9	400.3	398.6
6	403.7	397.4	396.8	397.8	399.1	397.6	397.5	396.8	396.8	400.0	399.0	398.2
7	402.1	397.3	396.9	397.8	398.7	399.9	397.5	396.8	397.2	399.8	404.1	398.4
8	403.1	397.2	396.9	397.8	398.4	399.4	397.3	396.8	397.3	402.4	405.8	398.8
9	403.7	397.2	396.9	397.8	398.5	398.4	397.3	396.3	397.3	403.5	403.8	398.5
10	400.3	397.2	396.9	397.8	398.6	397.8	397.3	396.2	398.1	402.5	401.2	401.7
11	399.2	397.2	397.0	398.0	398.7	397.3	397.3	396.5	401.9	401.5	399.8	404.0
12	398.5	397.2	396.8	398.6	398.5	396.7	397.3	396.6	398.8	400.6	399.3	405.5
13	398.1	397.2	396.8	398.5	398.2	395.6	397.3	396.6	398.5	399.7	399.1	402.5
14	397.8	397.2	398.1	398.7	398.0	395.3	397.3	396.6	398.1	399.0	398.8	399.3
15	398.7	397.2	401.7	398.6	398.0	395.3	397.3	396.6	398.0	398.8	399.1	399.2
16	398.5	397.2	401.8	398.2	398.0	395.3	397.3	396.6	398.0	398.7	399.1	399.0
17	397.6	397.2	401.9	398.1	397.9	395.3	397.3	396.6	397.7	398.2	399.0	399.0
18	397.0	397.2	401.8	397.9	397.3	395.3	398.1	396.6	397.6	397.8	398.8	399.0
19	397.0	397.2	402.0	397.5	397.3	395.0	397.8	396.6	397.5	397.8	398.8	399.2
20	399.8	397.2	402.2	396.9	397.3	395.7	397.8	396.6	397.5	397.9	398.8	399.2
21	402.0	397.2	402.4	396.6	397.3	395.9	398.1	396.6	398.0	398.5	398.8	399.2
22	399.8	397.2	402.9	396.6	397.3	395.7	397.6	396.6	398.1	398.4	398.8	399.2
23	398.1	397.2	404.1	396.6	397.3	395.6	397.8	396.6	397.9	398.3	398.8	399.5
24	397.8	397.2	405.1	396.6	397.3	396.9	397.8	396.6	398.2	398.1	398.6	404.9
25	397.8	397.2	404.7	402.0	397.1	396.8	398.6	396.6	398.4	397.8	398.3	405.0
26	397.8	397.2	403.7	402.5	396.7	397.4	398.5	396.6	398.7	397.8	398.6	403.6
27	397.8	397.2	403.0	404.1	395.6	398.7	398.4	396.6	398.8	397.8	398.8	401.9
28	397.8	397.2	403.4	401.6	395.3	397.7	398.6	396.6	399.1	401.9	398.8	402.0
29	397.8	......	405.1	398.9	398.9	397.4	399.0	396.6	398.8	403.3	398.8	402.8
30	397.8	......	404.0	397.7	398.0	397.6	398.5	396.6	398.6	401.2	398.6	401.5
31	397.8	......	403.3	......	397.0	......	397.8	396.6	......	399.1	......	402.1

PRECIPITATION AT SAVAGE RESERVOIR NEAR UTICA, N. Y.

A standard U. S. Weather Bureau pattern rain gage is located at Savage reservoir on the south slope of Mohawk valley about 3 miles southeast of Utica. The gage rim stands 4 feet above ground and is at elevation about 700 feet above tide. The record is furnished by the Consolidated Water Co. of Utica, N. Y.

Precipitation at Savage Reservoir near Utica, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	0.76	0.03	.....	.....	0.58	.....	0.31	0.41	.....	0.05	.....	.....
2	.....	0.03	0.17	.....	0.06	.....	0.2	0.54	.....	.....	.....	0.11
3	.....	0.1	0.11	.....	.....	0.08	0.19	0.76	0.51	.....	0.73	0.03
4	2.26	.....	0.03	.....	0.3	.....	.....	.....	1.3	0.76	0.25	.....
5	0.16	0.09	.....	0.04	0.08	0.02	.....	.....	0.55	0.08	0.04	.....
6	.....	0.29	0.01	0.06	.....	0.6	.....	0.11	0.2	0.31	.....	0.05
7	.....	.....	.....	.....	0.11	0.22	.....	.....	0.02	0.29	1.8	.....
8	0.52	.....	0.03	0.08	0.18	0.04	.....	0.03	0.16	0.97	0.21	.....
9	0.09	.....	0.02	0.15	0.13	.....	0.15	.....	0.08	0.1	.....	.....
10	0.02	0.02	.....	0.14	0.06	.....	.....	.....	0.09	.....	.....	0.42
11	0.02	0.02	.....	0.02	0.52	.....	.....	.....	0.1	0.08	0.04	0.2
12	0.06	.....	.....	.....	.....	.....	0.8	.....	1.6	0.2	0.09	0.02
13	0.06	.....	0.3	0.12	.....	.....	0.2	.....	.....	0.15	.....	.....
14	0.12	.....	0.2	0.15	.....	.....	.....	.....	.....	0.04	0.02	.....
15	0.12	0.06	0.03	.....	.....	0.06	.....	.....	.....	.....	0.03	0.49
16	.....	.....	0.02	.....	0.2	.....	.....	.....	.....	.....	.....	0.15
17	.....	0.16	.....	0.1	0.17	.....	0.05	0.48	0.06	.....	.....	.....

Precipitation at Savage Reservoir near Utica, N. Y.—(Continued).

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
18	0.06	0.03					0.52					0.03
19					0.72		0.57		0.09	0.05		0.02
20	0.22	0.02	0.87	0.07	0.08	0.03			0.02	0.04		
21	0.06	0.02					0.3	0.3	0.45	0.32	0.1	
22	0.02											
23	0.09	0.02					0.23		0.02			0.46
24			0.16	1.18				0.02	0.2			0.38
25	0.03	0.34	0.2			0.04	0.89	0.34	0.27		0.51	
26	0.33			0.57	0.24	0.1			0.03		0.01	0.07
27				0.58	0.84	0.76	0.2				0.21	
28			0.14		0.18	0.05		0.38	0.07	0.72	0.08	
29			0.09						0.39	0.22	0.12	0.05
30	0.08		0.04			0.78	0.18		0.37			
31								0.08				0.04

PRECIPITATION AT DEERFIELD RESERVOIR.

A standard U. S. Weather Bureau pattern rain gage was established at Deerfield reservoir in 1903. From January 1, 1901, to June, 1903, a rain gage five inches in diameter was used. This station is located on the north slope of Mohawk valley about 4 miles north of Utica and at elevation about 700 feet above tide. The record is furnished by the Consolidated Water Co. of Utica.

Precipitation at Deerfield Reservoir near Utica, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	0.23				0.41		0.58	0.73		0.02		
2		0.03	0.63				0.73	0.16	0.26			0.08
3		0.16	0.04		0.28	0.03	0.09	0.53	0.06		0.57	0.04
4	1.16		0.02		0.07				1.38	1.08	0.19	
5	0.08	0.1	0.01	0.07	0.06	0.01			0.17	0.01		
6		0.14		0.03		0.57		0.18	0.05	0.16		0.01
7					0.05	0.26			0.01	0.21	1.47	
8	0.30		0.02	0.01	0.21			0.04	0.16	0.81	0.16	
9	0.05			0.01	0.12		0.07		0.05	0.01		
10	0.02	0.01		0.16	0.01				0.12			0.26
11	0.04	0.01			0.42				0.24	0.13		0.22
12	0.02	0.01					0.94		1.19	0.17	0.1	0.01
13	0.07		0.25	0.08			0.07		0.01	0.06		
14	T		0.31	0.14						0.05	0.02	
15	0.08	0.03	0.04								0.02	0.42
16		0.04	0.02		0.27							0.13
17		0.15		0.13	0.12			0.62				
18	0.06	0.01					0.64					0.07
19	0.02				0.08		0.14		0.07	0.02		0.03
20	0.21	0.09	0.67	0.03	0.13	0.03				0.09		
21	0.01						0.78		0.4	0.23	0.14	
22	0.03											
23	0.04				0.01		0.2		0.03			0.61
24			0.33	0.87				0.11	0.14			0.3
25	0.01	0.09	0.1				0.65	0.11	0.11		0.31	
26	0.23			0.53	0.49		0.22		0.05		0.03	0.05
27				0.58	0.57	0.29			0.01		0.14	
28	0.02		0.31		0.26	0.01		0.34	0.08	0.91	0.13	
29			0.06						0.38	0.12	0.12	0.05
30	0.05			0.02		0.96	0.25		0.39	0.01		
31								0.06				0.02

GRAEFENBURG HYDROPHYSICAL STATION NEAR UTICA, N. Y.

GENERAL DESCRIPTION.

This station is located near Graefenburg reservoir, near Utica, about 4 miles south from the Mohawk river, and at altitude 1,100 feet above tide. This station was established in 1905 by Robert E. Horton for the purpose of determining the relation of rainfall, evaporation and ground water in the typical soils of the Mohawk valley. The station was maintained in coöperation with the U. S. Geological Survey preceding May 1, 1907, when it was turned over to this Department. A detailed description of the station, together with the records preceding 1907, may be found in the State Engineer's Report for 1906, Supplement, pages 215–245.

The instrumental equipment is as follows: In the instrument shelter are placed a Green standard thermometer, also Green maximum and minimum thermometers; a Lambrecht hair hygrometer; and a 4½-inch Queen aneroid barometer, which has been calibrated by comparison with a standard mercurial barometer.

A hair hygrometer has been used in preference to a wet bulb thermometer, as it is considered more reliable in the hands of an ordinary observer for use in the winter time. It is periodically compared with a standard wet and dry bulb, or sling psychrometer, and the bundle of hairs is moistened on the first of each month to insure their retention of hygroscopic power.

A standard 8-inch rain gage, United States Weather Bureau pattern, having its rim 4.5 feet above ground is used; also a Robinson anemometer, United States Weather Bureau pattern, made by Julien P. Frieze, having its cups at the same altitude. The anemometer readings are taken directly from the dial twice each day, and the total wind movement is deduced by a reduction table based on Marvin's experiments.

Two Green soil thermometers, having their bulbs inserted in the natural soil beneath the grass sod, one to 2 inches and the other to 24 inches depth, are also used.

During the summer season, the evaporation from free water surface is measured by means of a rectangular tank 3 feet and 2 feet deep, buried in the soil to within 3 inches of the top. A brass needle projects in the center to within 3 inches of the top. The evaporation is determined each morning by means of a standard brass cup of 212 cubic centimeters capacity. One cupful represents 0.01 inch depth on the surface of the tank. The observer records the number of cupfuls added or removed each morning, in order to raise or reduce the water-level to the needle point. The standard evaporation tank is not used in the frozen season.

On December 1, 1904, two lysimeters were in place. Two additional lysimeter records were begun June 25, 1905, and another August 12, 1905. The lysimeters are galvanized iron tanks with wrought bands. They were filled by placing the tank (with the cover, which fits over the bottom, removed), upright on the ground, and driving the can downward over a prism of soil digging away at the sides as much as necessary in order to drive the can downward with a heavy hammer. After the can had been driven downward over a prism of soil to its full depth, the soil was dug away around the bottom, a temporary bottom inserted, and the tank and its contained soil were lifted sufficiently to enable the conical bottom to be put in position. The lysimeter was then placed upon a wooden foundation, and connected with the gage cans in the adjoining pit by means of a short ½-inch lead pipe. The first two cans installed were filled in this manner with soil *in situ,* which is a heavy clay, formed by disintegration of Utica shale, which lies at a depth of a few feet underneath the surface. Both lysimeters were left with the natural sod surface until August 1, 1905, after which date the grass growing on the second lysimeter has been cut short. Number 3 lysimeter was filled in the same manner with soil comprising a sandy loam surface soil to about 18 inches in depth, and beneath this heavy clay, similar to that in the first two lysimeters.

Numbers 4 and 5 were filled with a medium coarse, rather humus and open sand, found at a distance of about one mile from the station. These lysimeters, after being filled in the manner previously described, were closed at both ends and drawn to the station. When filling in the above described manner, an effort was made to obtain samples of the different soils in an undisturbed natural condition.

In the gage-pit are placed galvanized cans, one foot diameter and one foot deep, with close-fitting covers. Within these are smaller galvanized cans, made very accurately, each 0.535 foot inside diameter, and having a notch in one side, into which the drainage from the lysimeter is conducted through a short section of rubber hose, connected with the lead pipes described.

The smaller gage cans have a sectional area one-tenth that of the surface area of the lysimeters. The depth of the percolation is multiplied ten times in these cans. Care is taken to set the cans level, and the depth of percolation is measured by means of an ordinary rain gage stick.

In case of overflow from the small can into the larger can between two readings, the total amount is measured by successive fillings of the small can. If the rate of infiltration is slow, the water is left in the small can until it becomes nearly full. This is done in order to avoid, if possible, an error in measuring a very small quantity from the gage cans.

During periods of heavy rainfall or snow melting, the lysimeters, notably numbers 1 and 2, have frequently shown percolation in excess of the contemporaneous rainfall. During 1907 the lysimeters were unearthed, and it was found that excessive ground water probably entered the drain pipe around the bottom of the lysimeter at times; owing to this condition the lysimeter records, excepting for dry periods, are void preceding August, 1907. In August, 1907, the bottom of each lysimeter was bedded in cement mortar, which will, it is believed, effectively prevent any entrance of water at the bottoms.

A record of the depth of the natural ground water table below the soil surface is kept in an unused well adjacent to the lysimeter station.

GRAEFENBURG HYDROPHYSICAL RECORDS.

Month of January, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	234	.168	32.0	....	....	31.5	32.5	....	T	....	0.02	3.56	0.41	0.42	3.65	....	....	....
2	203	.135	28.2	....	....	31.5	32.5	....	....	....	0.21	0.35	0.02	0.01	0.30	....	....	....
3	155	.195	41.2	....	....	31.0	32.5	....	1.94	....	3.48	3.51	3.16	3.22	3.55	....	....	....
4	305	.164	33.2	....	....	31.5	32.5	....	0.15	....	3.69	3.66	3.02	3.65	3.65	....	....	....
5	163	.115	30.5	....	....	31.5	32.5	....	....	....	1.02	3.66	0.09	0.15	1.79	....	....	....
6	138	.185	39.8	....	....	30.8	32.5	....	T	....	1.00	1.81	0.11	0.04	0.58	....	....	....
7	80	.474	35.8	....	....	31.5	32.5	....	0.47	....	1.67	0.22	0.57	1.07	3.17	....	....	....
8	240	.437	35.0	....	....	31.8	32.5	....	0.05	....	3.69	3.66	0.26	0.29	1.54	....	....	5.7
9	328	.062	16.8	....	....	31.5	32.5	....	T	....	1.40	3.66	0.13	0.10	1.25	....	....	....
10	318	.081	24.8	....	....	27.8	32.5	....	*0.01	....	0.09	0.86	0.07	0.08	0.20	....	....	....
11	191	.102	24.5	....	....	29.5	32.5	....	*0.04	....	0.01	0.61	0.01	0.02	0.00	....	....	....
12	265	.131	28.0	....	....	29.0	32.5	....	*0.05	....	0.02	0.02	0.02	0.00	0.00	....	....	....
13	192	.106	21.8	....	....	29.0	32.5	....	0.09	....	0.01	0.00	0.00	0.00	0.00	....	....	....
14	198	.170	32.8	....	....	29.8	32.5	....	0.11	....	0.02	0.01	0.00	0.00	0.30	....	....	....
15	164	.066	11.5	....	....	30.0	32.5	....	T	....	0.00	0.00	0.00	0.00	1.26	....	....	6.9
16	172	.022	—0.5	....	....	24.0	32.0	....	....	....	0.00	0.00	0.00	0.00	....	....	....	....
17	252	.058	8.2	....	....	18.5	32.0	....	*0.04	....	0.00	0.00	0.00	0.00	....	....	....	....
18	105	.123	25.8	....	....	24.5	32.0	....	T	....	0.00	0.00	0.67	....	....	....	....	....
19	396	.200	38.2	....	....	28.2	32.0	....	0.22	....	3.54	2.78	1.39	2.28	3.71	....	....	....
20	391	.127	26.5	....	....	31.2	32.0	....	0.05	....	3.69	3.68	....	2.02	3.71	....	....	....
21	182	.046	8.8	....	....	26.8	31.8	....	*0.01	....	....	....	....	....	....	....	....	7.2
22	165	.042	7.0	....	....	23.8	31.5	....	*0.05	....	....	....	....	....	....	....	....	....
23	102	.015	—12.5	....	....	19.8	31.0	....	....	....	....	....	....	....	....	....	....	....
24	102	.020	—9.8	....	....	16.5	31.0	....	*0.01	....	....	....	....	....	....	....	....	....
25	89	.057	5.8	....	....	20.2	31.0	....	*0.30	....	....	....	....	....	....	....	....	....
26	170	.041	4.2	....	....	25.0	30.5	....	....	....	....	....	....	....	....	....	....	....
27	138	.041	6.5	....	....	25.0	30.0	....	T	....	....	....	....	....	....	....	....	....
28	150	.054	11.8	....	....	24.0	30.0	....	....	....	....	....	....	....	....	....	....	7.7
29	128	.070	15.2	....	....	25.0	30.0	....	*0.05	....	....	....	....	....	....	....	....	....
30	110	.042	3.5	....	....	23.2	30.0	....	....	....	....	....	....	....	....	....	....	....
31	202	.061	17.5	....	....	25.5	30.0	....	*0.02	....	....	....	....	....	....	....	....	....

T means trace. * Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of February, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	Mean Soil Temperature.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	Percolation Through Lysimeter. *Inches.*					Accumulated Snow on Ground in Woods. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				Clay, long grass. 1	Clay, short grass. 2	Clay and loam, bare. 3	Sand, long grass. 4	Sand, bare. 5	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	270	.139	27.8			26.5	30.0		.03									
2	324	.136	31.5			28.8	30.0		.08									
3	309	.037	7.8			27.5	30.0		*T									
4	94	.038	8.0			25.8	30.0		*.07									
5	89	.042	5.8			25.0	30.0		.21									
6	154	.015	0.5			25.2	30.0											
7	80	.037	8.5			24.5	30.0											
8	106	.049	11.0			24.8	29.8											5.7
9	182	.076	20.0			24.5	29.5		*T									
10	352	.101	22.8			25.2	29.5		*.01									
11	266	.035	1.0			25.5	29.5		*T									
12	223	.029	—1.0			25.2	29.5		*T									
13	254	.081	24.8			24.8	29.5											
14	288	.105	25.0			25.8	29.5		.04									
15	233	.084	23.2			28.0	29.5		T									6.9
16	131	.135	29.8			28.8	30.0		.15									
17	244	.061	8.8			29.2	30.0		T									
18	160	.040	9.8			27.2	30.0											
19	241	.096	26.0			27.0	30.0		.01									
20	205	.075	18.8			28.0	30.0		T									
21	324	.047	8.5			27.8	30.0											7.2
22	195	.022	—3.0			26.5	30.0		T									
23	194	.018	—4.5			22.2	29.8											
24	333	.057	9.5			20.0	29.5		.15									
25	320	.057	6.2			23.5	29.2		T									
26	137	.030	4.5			20.8	28.5											
27	176	.028	4.0			20.8	28.5											
28	228	.035	9.8			19.8	28.2		.00									7.7

T means trace. * Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of March, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	302	.104	24.2	....	....	21.5	28.0	....	.16	....	....	....	....	....	....	....	....	....
2	301	.135	28.5	....	....	26.0	28.0	....	*.05	....	....	....	....	....	....	....	....	....
3	240	.075	17.5	....	....	29.8	29.0	....	*.01	....	....	....	....	....	....	....	....	....
4	177	.069	15.5	....	....	28.5	29.5	....	T	....	....	....	....	....	....	....	....	....
5	166	.069	19.0	....	....	27.8	29.5	....	*.04	....	....	....	....	....	....	....	....	12.6
6	152	.048	9.2	....	....	28.5	29.5	....	....	....	....	....	....	....	....	....	....	....
7	160	.049	12.5	....	....	26.2	29.5	....	*.02	....	....	....	....	....	....	....	....	....
8	261	.085	21.2	....	....	27.2	29.5	....	T	....	....	....	....	....	....	....	....	....
9	165	.056	16.8	....	....	28.5	29.5	....	....	....	....	....	....	....	....	....	....	....
10	147	.065	17.5	....	....	27.8	29.5	....	....	....	....	....	....	....	....	....	....	....
11	154	.075	20.8	....	....	28.0	29.5	....	....	....	....	....	....	....	....	....	....	....
12	226	.139	31.0	....	....	29.0	29.8	....	.27	....	....	....	....	....	....	....	....	13.2
13	136	.201	35.2	....	....	30.2	30.0	....	.20	....	....	....	....	....	....	....	....	....
14	254	.151	28.0	....	....	30.8	30.0	....	*.01	....	....	....	....	....	....	....	....	....
15	257	.120	30.2	....	....	30.2	30.0	....	*.01	....	....	....	....	....	....	....	....	....
16	286	.126	37.8	....	....	31.0	30.0	....	....	....	....	....	....	....	....	....	....	....
17	197	.187	31.8	....	....	31.0	30.5	....	....	....	....	....	....	....	....	....	....	....
18	146	.096	26.2	....	....	30.2	30.5	....	....	....	....	....	....	....	....	....	....	....
19	422	.090	31.2	....	....	30.0	30.5	....	.56	....	....	....	....	....	....	....	....	13.7
20	275	.099	27.8	....	....	30.0	30.5	....	....	....	....	....	....	....	....	....	....	....
21	156	.135	35.8	....	....	28.5	30.5	....	....	....	....	....	....	....	....	....	....	....
22	182	.220	45.8	....	....	31.5	30.5	....	....	....	.02	.39	.03	....	3.12	....	....	....
23	251	.187	40.8	....	....	32.5	30.5	....	.16	....	.01	.00	.02	....	.35	....	....	....
24	271	.172	32.2	....	....	32.5	30.5	....	.21	....	1.48	1.35	.05	....	3.33	....	....	....
25	198	.133	31.8	....	....	33.0	30.8	....	....	....	1.24	1.56	.10	....	1.90	....	....	13.2
26	244	.179	42.2	....	....	34.5	31.0	....	....	....	.62	.22	.08	....	....	....	....	....
27	221	.298	49.2	....	....	37.5	31.0	....	.11	....	3.10	1.72	.06	....	2.88	....	....	....
28	75	.325	53.0	....	....	42.5	31.0	....	.02	....	1.06	1.68	.89	....	.80	....	....	....
29	218	.251	56.8	....	....	42.2	31.2	....	.04	....	.65	2.00	.43	.04	3.68	....	....	....
30	233	.149	37.2	....	....	39.5	31.0	....	....	....	.06	3.63	.16	.15	3.68	....	....	....
31	246	....	28.2	....	....	33.2	31.0	....	.00	....	.03	.56	.05	.38	3.68	....	....	....

T means trace. * Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of April, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	196	.083	21.5	......	......	33.0	31.0	......	0	......	.01	.04	.02	.08	.53	......	......	......
2	168	.079	25.8	......	......	32.0	31.2	......	0	......	.01	.01	0	.15	.07	......	......	......
3	126	.126	36.8	......	......	32.0	31.2	......	0	......	.03	.02	.02	.05	.05	......	......	......
4	182	.197	50.2	......	......	35.0	31.5	......	.04	......	.01	.02	0	.13	.13	......	......	......
5	261	.140	28.2	......	......	37.0	31.2	......	.05	......	.01	.01	0	.15	.20	......	......	......
6	166	.063	28.8	......	......	33.5	31.2	......	0	......	0	.01	0	.03	.10	......	......	......
7	383	.100	32.5	......	......	32.0	31.2	......	.07	......	0	.01	0	0	.05	......	......	......
8	344	.145	29.8	......	......	32.0	31.5	......	.06	......	.01	.02	0	.01	.01	......	......	5.7
9	256	.150	32.5	......	......	32.0	31.5	......	*.10	......	.01	0	.01	0	.04	......	......	......
10	243	.147	28.8	......	......	32.0	31.2	......	*.02	......	0	.03	.01	.18	.05	......	......	......
11	181	.119	34.0	......	......	32.2	31.5	......	0	......	1.27	1.15	.35	.13	1.13	......	......	......
12	143	.138	34.8	......	......	31.8	31.5	......	*.10	......	2.10	1.77	.40	.15	1.82	......	......	......
13	112	.164	31.2	......	......	34.5	31.5	......	*.14	......	1.09	0	.44	.95	0	......	......	......
14	317	.133	28.5	......	......	32.0	31.2	......	0	......	2.10	0	.26	.60	0	......	......	......
15	217	.119	31.2	......	......	32.0	31.2	......	0	......	.10	0	.08	.05	0	......	......	6.9
16	207	.128	34.2	......	......	32.5	31.5	......	*.07	......	.03	0	.03	.04	0	......	......	......
17	266	.144	32.0	......	......	33.2	31.5	......	0	......	.03	2.22	.04	.06	3.09	......	......	......
18	176	.119	32.0	......	......	32.5	31.5	......	0	......	.03	.25	.02	0	.23	......	......	......
19	153	.141	32.2	......	......	32.5	31.5	......	.06	......	.03	.02	.01	.02	.02	......	......	......
20	328	.096	28.8	......	......	32.8	31.5	......	0	......	0	0	.02	.01	0	......	......	......
21	287	.090	35.2	......	......	32.5	31.5	......	0	......	.02	.03	0	.01	0	......	......	7.2
22	186	.085	34.8	......	......	36.5	31.5	......	0	......	.01	0	0	0	0	......	......	......
23	157	.235	41.0	......	......	40.0	31.5	......	1.15	......	.40	.40	.17	.11	.65	......	......	......
24	278	.165	41.2	......	......	41.8	31.5	......	0	......	3.00	2.95	.57	2.03	2.75	......	......	......
25	188	.215	41.8	......	......	38.5	32.8	......	.57	......	3.38	.04	.29	1.37	.05	......	......	......
26	94	.205	36.5	......	......	39.5	35.5	......	.61	......	.37	0	1.00	2.23	0	......	......	......
27	118	.138	44.5	......	......	41.5	35.5	......	0	......	0	.01	.38	.74	0	......	......	......
28	175	285	53.8	......	......	46.0	37.5	......	0	......	0	0	.01	.11	0	......	......	7.7
29	317	.423	64.2	......	......	50.5	38.5	......	0	......	1.10	0	.09	.05	2.22	......	......	......
30	293	.416	56.0	......	......	53.0	40.5	......	.63	......	.74	0	.06	.14	1.48	......	......	......

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of May, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	134	.168	40.0	46.8	....	45.5	42.0	....	.06	—.04	1.26	3.70	.06	.30	3.70	....	....	....
2	120	.199	46.2	50.0	....	45.5	41.5	....	0	.09	.90	3.70	.02	.08	3.70	....	....	....
3	182	.291	47.0	48.8	....	47.5	41.5	....	.25	.13	.10	5.97	.06	.07	1.03	....	....	6.9
4	260	.181	33.0	40.2	....	42.5	42.0	....	.10	—.07	.10	5.90	.07	.05	1.65	....	....	....
5	169	.178	43.5	46.0	....	42.0	41.5	....	0	.14	.05	.80	.03	.10	.55	....	....	....
6	94	.278	48.0	47.5	....	45.5	41.0	....	.10	—.03	.04	.46	.04	.04	.02	....	....	....
7	93	.262	44.0	46.5	....	46.5	41.5	....	.20	.02	.03	.59	.06	.06	.03	....	....	....
8	98	.233	50.5	53.2	....	49.0	42.0	....	.12	.06	.08	1.05	.05	.08	.33	....	....	....
9	170	.275	49.8	53.8	....	52.0	43.5	....	.10	.07	.05	.05	.06	.07	.15	....	....	....
10	164	.172	34.5	50.0	....	47.5	44.0	....	*.37	—.03	.05	.05	.04	.03	.05	....	....	6.7
11	177	.139	34.0	46.0	....	40.0	43.5	....	0	.00	1.30	3.60	.26	.12	3.65	....	....	....
12	189	.155	46.2	47.0	....	42.0	42.0	....	0	.18	.95	3.60	.08	.08	3.70	....	....	....
13	244	.302	65.0	57.0	....	49.5	42.0	....	0	.18	.05	3.70	.03	.07	.27	....	....	....
14	228	.391	68.5	65.8	....	57.5	43.5	....	0	.18	.06	.58	.04	.01	.03	....	....	....
15	298	.354	62.0	44.5	....	56.5	45.5	....	.18	.14	.01	.43	.01	.01	0	....	....	....
16	90	.288	49.5	54.0	....	55.5	46.5	....	.14	.04	.01	.17	0	.01	0	....	....	....
17	105	.260	57.0	42.2	....	53.5	47.0	....	0	.14	0	.01	0	0	.02	....	....	7.5
18	103	.378	54.2	53.2	....	54.0	47.0	....	.88	.03	.58	.43	.22	.07	.63	....	....	....
19	138	.329	53.2	55.5	....	54.0	48.0	....	.10	.10	.39	2.66	.17	.26	2.75	....	....	....
20	271	.188	42.8	48.0	....	49.0	48.0	....	0	.18	.05	1.41	.05	.07	.18	....	....	....
21	245	.186	28.8	43.8	....	43.5	47.0	....	0	.14	.01	.02	0	.03	.05	....	....	....
22	184	.230	43.0	44.2	....	42.5	45.5	....	0	.10	.01	.05	.01	0	0	....	....	....
23	50	.261	51.2	51.5	....	48.0	45.0	....	0	.06	.02	0	0	0	.01	....	....	....
24	115	.195	48.8	51.0	....	49.5	45.5	....	0	.18	0	0	.01	0	0	....	....	8.5
25	202	.185	50.0	50.2	....	49.0	46.0	....	.38	.22	.01	0	0	0	0	....	....	....
26	194	.276	43.2	46.2	....	46.0	46.5	....	.71	.03	.04	0	.16	.01	0	....	....	....
27	251	.256	43.0	45.5	....	48.0	46.0	....	.16	.04	.05	.06	.13	.19	.16	....	....	....
28	324	.157	28.5	43.8	....	45.5	46.0	....	0	.10	.06	.07	.08	.11	.14	....	....	....
29	175	.188	44.8	48.5	....	44.0	45.0	....	0	.18	.04	.03	.03	.02	.07	....	....	....
30	159	.259	50.5	53.5	....	48.0	45.0	....	0	.15	.01	.03	0	0	.02	....	....	....
31	145	.273	50.2	57.0	....	51.5	45.5	....	0	.15	.01	0	0	0	.02	....	....	....

* Snow

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of June, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	Mean Soil Temperature.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	Percolation Through Lysimeter. *Inches.*					Accumulated Snow on Ground in Woods. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				Clay, long grass.	Clay, short grass.	Clay and loam, bare.	Sand, long grass.	Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	137	.276	52.2	54.5	......	52.0	46.5	......	0	.06	.01	.01	.01	0	0	......	......	......
2	156	.282	46.5	51.5	......	50.0	47.0	......	.08	0	.01	0	0	.01	0	......	......	......
3	97	.286	55.2	57.5	......	52.5	47.0	......	0	.10	.01	0	.10	0	0	......	......	6.9
4	187	.289	57.5	56.5	......	53.5	47.5	......	0	.12	.02	0	0	0	0	......	......	......
5	170	.377	52.5	53.8	......	52.5	48.0	......	.65	.15	0	.01	.26	0	.01	......	......	......
6	174	.324	48.5	49.8	......	50.5	48.0	......	.30	—.10	0	0	0	0	0	......	......	......
7	100	.306	50.5	53.0	......	53.0	48.0	......	.02	—.02	0	0	.04	0	.02	......	......	......
8	97	.293	54.8	58.2	......	51.0	48.0	......	0	.10	0	0	.03	0	.09	......	......	......
9	120	.307	55.0	58.8	......	53.5	48.5	......	0	.12	0	0	.02	0	.05	......	......	......
10	68	.324	56.0	60.2	......	50.5	49.0	......	0	.12	0	0	0	0	.02	......	......	6.7
11	150	.329	56.5	62.0	......	56.5	49.5	......	0	.18	0	0	.01	0	0	......	......	......
12	95	.326	59.8	64.0	......	52.0	50.0	......	0	.09	0	0	0	0	0	......	......	......
13	89	.332	59.5	62.2	......	53.0	51.0	......	0	.10	0	0	0	0	0	......	......	......
14	101	.389	62.0	60.5	......	54.0	51.5	......	.04	.10	0	0	0	0	0	......	......	......
15	113	.355	62.0	66.2	......	54.5	52.0	......	0	.16	0	0	0	0	0	......	......	......
16	130	.356	62.2	61.2	......	54.0	52.0	......	0	.18	0	0	0	0	0	......	......	......
17	113	.417	70.2	68.0	......	55.0	52.5	......	0	.14	0	0	0	0	0	......	......	7.5
18	85	.443	70.5	73.5	......	56.5	53.0	......	0	.08	0	0	0	0	0	......	......	......
19	72	.339	53.0	70.8	......	54.0	53.0	......	0	.10	0	0	0	0	0	......	......	......
20	65	.481	62.8	68.2	......	61.0	54.5	......	0	.10	0	0	0	0	0	......	......	......
21	66	.509	72.2	74.8	......	65.5	55.0	......	0	.10	0	0	0	0	0	......	......	......
22	60	.536	75.8	79.5	......	66.5	56.0	......	0	.10	0	0	0	0	0	......	......	......
23	133	.577	73.2	73.0	......	66.5	56.5	......	0	.10	0	0	0	0	0	......	......	......
24	77	.652	72.8	74.2	......	67.5	57.0	......	.06	.05	0	0	0	0	0	......	......	8.5
25	76	.736	76.0	74.2	......	68.5	57.5	......	.08	.08	0	0	0	0	0	......	......	......
26	172	.593	63.2	67.2	......	67.0	58.0	......	.92	.17	0	0	0	0	0	......	......	......
27	195	.456	63.5	62.5	......	61.0	58.0	......	.05	.05	0	0	0	0	0	......	......	......
28	96	.521	69.8	68.5	......	66.0	57.8	......	0	.10	0	0	0	0	0	......	......	......
29	80	.508	62.8	67.5	......	64.0	57.2	......	.74	.14	0	0	0	0	0	......	......	......
30	118	.530	63.0	62.8	......	62.0	58.0	......	.31	—.09	0	0	0	0	0	......	......	......

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of July, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				Clay, long grass.	Clay, short grass.	Clay and loam, bare.	Sand, long grass.	Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	82	.556	68.5	71.2	....	66.5	63.0	....	.31	.06	0	0	0	0	0	....	....	10.1
2	172	.448	58.2	68.8	....	66.0	63.0	....	.10	.05	0	0	0	0	0	....	....	....
3	106	.324	58.8	67.2	....	64.5	63.0	....	0	.10	0	0	0	0	0	....	....	....
4	57	.269	49.2	61.5	....	63.5	63.0	....	0	.10	0	0	0	0	.11	....	....	....
5	47	.390	66.2	66.2	....	63.0	62.0	....	0	.10	0	0	0	0	0	....	....	....
6	48	.507	67.2	68.0	....	64.5	62.0	....	0	.15	0	0	0	0	0	....	....	....
7	102	.501	71.5	68.8	....	66.5	62.0	....	0	.15	0	0	0	0	0	....	....	....
8	84	.546	66.0	68.2	....	68.0	62.0	....	.17	.08	0	0	0	0	0	....	....	10.5
9	184	.464	66.2	70.0	....	66.0	63.0	....	0	.10	0	0	0	0	0	....	....	....
10	96	.399	55.0	72.2	....	68.0	63.0	....	0	.10	0	0	0	0	0	....	....	....
11	187	.491	61.2	62.0	....	69.5	63.0	....	.94	.24	0	0	0	0	0	....	....	....
12	187	.491	63.2	74.5	....	71.0	64.0	....	.20	.05	0	0	0	0	05	....	....	....
13	114	.419	66.0	67.2	....	68.0	64.0	....	0	.10	0	0	0	0	.17	....	....	....
14	61	.463	72.8	65.8	....	64.0	64.0	....	0	.10	0	0	0	0	.04	....	....	....
15	124	.498	71.0	66.8	....	63.5	64.0	....	0	.10	0	0	0	0	.04	....	....	11.7
16	171	.676	72.2	64.8	....	63.0	63.0	....	0	.10	0	0	0	0	0	....	....	....
17	52	.715	73.5	69.2	....	65.5	63.0	....	.98	.03	0	0	0	0	.01	....	....	....
18	86	.526	73.5	64.2	....	64.5	63.0	....	.20	.05	.01	0	.11	0	.32	....	....	....
19	103	.508	75.0	67.2	....	63.5	63.0	....	.05	.15	0	0	.02	0	.12	....	....	....
20	128	.569	70.2	68.5	....	65.5	63.0	....	.07	—.28	0	0	.16	0	.05	....	....	....
21	124	.426	66.5	63.8	....	65.0	63.0	....	0	.10	0	0	.08	0	.17	....	....	....
22	114	.522	65.5	63.5	....	62.5	63.0	....	.17	—.03	0	0	.02	0	.03	....	....	11.5
23	77	.786	75.5	63.8	....	61.5	62.0	....	0	.10	0	0	0	0	.05	....	....	....
24	117	.721	61.2	65.0	....	63.0	62.0	....	1.01	.11	.17	0	.32	0	.05	....	....	....
25	106	.569	70.2	62.5	....	61.5	62.0	....	0	.10	.13	0	.25	0	.36	....	....	....
26	267	.436	62.2	63.8	....	59.5	61.5	....	.17	.27	.03	0	.06	0	.16	....	....	....
27	240	.369	63.5	64.2	....	58.5	61.0	....	0	.12	.03	0	.01	0	.07	....	....	....
28	117	.402	66.8	59.5	....	61.0	60.5	....	0	.10	0	0	.02	0	.01	....	....	....
29	46	.481	70.2	61.8	....	59.0	60.5	....	.12	.20	0	0	0	0	.01	....	....	11.6
30	129	.461	64.5	61.8	....	59.0	60.5	....	0	.10	0	0	0	0	0	....	....	....
31	83	.502	63.2	58.0	....	59.0	60.0	....	.20	0	0	0	0	0	0	....	....	....

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of August, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				Clay, long grass.	Clay, short grass.	Clay and loam, bare.	Sand, long grass.	Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	112	.392	56.0	71.2	....	66.5	63.0	....	.49	.09	.02	0	0	.06	0	....	....	....
2	98	.397	58.8	68.8	....	66.0	63.0	....	.72	.22	.19	0	.34	.21	.09	....	....	....
3	128	.423	63.2	67.2	....	64.5	63.0	....	0	0	.06	.02	.07	.12	.15	....	....	....
4	61	.397	63.0	61.5	....	63.5	63.0	....	0	.04	.03	.02	.02	.02	.02	....	....	....
5	119	.445	64.5	66.2	....	63.0	62.0	....	.03	.06	0	0	0	0	.06	....	....	9.3
6	101	.530	66.2	68.0	....	64.5	62.0	....	0	.10	0	0	.01	0	0	....	....	....
7	89	.491	70.2	67.8	....	66.5	62.0	....	.02	.08	.02	0	.02	0	0	....	....	....
8	63	.470	66.2	68.2	....	68.0	62.0	....	0	.10	0	0	0	0	0	....	....	....
9	96	.491	67.5	70.0	....	66.0	63.0	....	0	.10	0	0	0	0	0	....	....	....
10	56	.601	70.8	72.2	....	68.0	63.0	....	0	.10	0	0	0	0	0	....	....	....
11	63	.622	77.2	62.0	....	69.5	63.0	....	0	.12	.01	0	0	.02	0	....	....	....
12	112	.619	75.0	74.5	....	71.0	64.0	....	0	.12	0	0	0	0	0	....	....	9.4
13	175	.365	63.5	67.2	....	68.0	64.0	....	0	.12	0	0	0	0	0	....	....	....
14	131	.363	59.2	65.8	....	64.0	64.0	....	0	.14	0	0	0	0	0	....	....	....
15	96	.383	61.8	66.8	....	63.5	64.0	....	0	.20	0	0	0	0	0	....	....	....
16	214	.451	66.5	64.8	....	63.0	63.0	....	.50	.50	0	0	0	0	0	....	....	....
17	133	.542	72.5	69.2	....	65.5	63.0	....	0	.12	0	0	0	0	0	....	....	....
18	76	.417	60.2	64.2	....	64.5	63.0	....	0	.10	0	0	0	0	0	....	....	....
19	151	.407	69.8	67.2	....	63.5	63.0	....	0	.10	0	0	0	0	0	....	....	9.5
20	93	.547	67.0	68.5	....	65.5	63.0	....	.35	.35	0	0	0	0	.10	....	....	....
21	68	.424	58.8	63.8	....	65.0	63.0	....	0	.04	0	0	0	.07	.02	....	....	....
22	59	.311	60.2	63.5	....	62.5	63.0	....	0	.12	0	0	0	0	.03	....	....	....
23	136	.451	64.0	63.8	....	61.5	62.0	....	T	.10	.01	.01	0	.01	0	....	....	....
24	103	.493	66.2	65.0	....	63.0	62.0	....	.45	.18	.01	0	0	0	0	....	....	....
25	173	.371	61.0	62.5	....	61.5	62.0	....	0	.10	0	0	0	0	0	....	....	....
26	148	.390	61.5	63.8	....	59.5	61.5	....	0	.10	0	0	0	0	0	....	....	9.6
27	50	.492	60.5	64.2	....	58.5	61.0	....	.37	.12	0	0	0	0	0	....	....	....
28	80	.352	58.5	59.5	....	61.0	60.5	....	0	.07	0	0	0	0	0	....	....	....
29	110	.311	58.0	61.8	....	59.0	60.5	....	0	.10	0	0	0	0	0	....	....	....
30	69	.368	58.8	61.8	....	59.0	60.0	....	.10	.14	.01	0	0	0	0	....	....	....
31	83	.340	55.5	58.0	....	59.0	60.0	....	0	.10	0	0	0	0	0	....	....	....

T Trace.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of September, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				Clay, long grass.	Clay, short grass.	Clay and loam, bare.	Sand, long grass.	Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	103	.393	62.2	61.2	....	58.5	60.0	....	0	.10	0	0	0	0	0	....	....	....
2	112	.526	63.0	61.8	....	60.0	59.5	....	.35	.11	0	0	0	0	0	....	....	....
3	70	.524	64.2	63.8	....	61.2	56.8	....	1.22	—.03	0	0	0	0	0	....	....	....
4	48	.612	67.5	67.5	....	63.8	60.0	....	.51	—.05	0	0	0	0	.02	....	....	....
5	94	.529	64.0	64.8	....	65.5	60.5	....	.26	.25	0	0	.02	0	0	....	....	....
6	114	.431	59.5	62.8	....	62.0	61.0	....	.02	.12	0	0	0	0	0	....	....	....
7	65	.441	61.0	64.5	....	63.0	61.0	....	.15	.07	0	0	.05	0	.03	....	....	....
8	105	.556	64.8	63.5	....	63.0	61.0	....	.07	.12	0	0	0	0	0	....	....	....
9	144	.579	64.5	64.2	....	62.5	61.0	....	.10	.10	0	0	0	0	.08	....	....	....
10	132	.558	64.2	64.8	....	64.0	61.0	....	.13	—.07	0	0	0	0	0	....	....	....
11	120	.529	63.2	63.0	....	64.0	61.0	....	1.70	—.05	.41	3.41	.78	.48	3.47	....	....	....
12	141	.417	58.5	61.0	....	60.5	61.0	....	T	.10	.03	.02	.15	.27	2.10	....	....	....
13	93	.452	60.5	64.2	....	61.0	61.0	....	0	.12	.02	0	.02	.05	.15	....	....	....
14	165	.464	67.5	65.8	....	63.0	61.0	....	0	.13	0	0	.03	.03	.05	....	....	....
15	105	.556	68.8	67.8	....	64.5	61.0	....	0	.11	0	0	0	0	0	....	....	....
16	148	.561	69.2	68.5	....	67.0	61.5	....	.03	.07	0	0	.02	0	.03	....	....	....
17	110	.400	59.0	65.8	....	66.0	62.0	....	0	.13	0	0	0	0	0	....	....	....
18	170	.333	50.8	58.8	....	59.5	62.0	....	.10	.10	0	0	0	0	0	....	....	....
19	121	.377	52.5	56.0	....	56.0	61.0	....	.02	.06	0	0	0	0	0	....	....	....
20	117	.558	67.2	65.5	....	60.5	60.0	....	.43	.03	0	0	0	0	.01	....	....	....
21	61	.492	64.8	66.5	....	65.0	60.0	....	0	.07	0	0	0	0	0	....	....	....
22	97	.341	52.2	59.8	....	61.0	61.0	....	.02	.03	0	0	.01	0	0	....	....	....
23	165	.382	54.5	57.0	....	57.0	60.5	....	.19	.04	0	0	0	0	0	....	....	....
24	155	.348	57.0	59.2	....	59.0	60.0	....	.12	.04	.01	0	0	0	0	....	....	....
25	165	.345	44.2	55.8	....	54.5	59.5	....	.03	.03	0	0	0	0	0	....	....	....
26	137	.225	41.8	52.2	....	52.0	58.5	....	0	.12	0	0	0	0	0	....	....	....
27	98	.321	51.8	52.8	....	51.0	57.0	....	0	.10	0	0	0	0	0	....	....	....
28	287	.434	56.5	52.0	....	51.5	56.0	....	.37	.11	0	0	0	0	0	....	....	....
29	150	.368	50.5	50.0	....	50.0	55.5	....	.45	.05	0	0	.04	0	0	....	....	....
30	182	.243	41.2	49.2	....	51.0	55.0	....	.04	.04	0	0	0	0	0	....	....	....

T Trace.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of October, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				Clay, long grass.	Clay, short grass.	Clay and loam, bare.	Sand, long grass.	Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	108	.195	35.2	47.2	....	49.0	55.0	....	0	.05	.04	.02	.10	.10	.22	....	....	7.9
2	84	.299	49.0	51.0	....	49.5	54.0	....	0	.10	0	0	0	0	0	....	....	....
3	100	.489	62.2	57.0	....	52.0	55.5	....	.04	.14	.18	1.18	.18	.15	.15	....	....	....
4	184	.386	55.2	55.8	....	57.0	55.0	....	0	.08	.25	.95	.27	.28	.11	....	....	....
5	123	.332	50.5	51.8	....	52.5	55.0	....	.39	.12	.05	.05	.06	.03	.15	....	....	....
6	159	.247	49.8	51.2	....	51.0	55.0	....	.17	.12	.06	.08	.08	.08	.11	....	....	....
7	270	.369	57.2	54.5	....	53.5	54.0	....	1.15	—.15	1.59	3.67	.34	.11	.86	....	....	8.3
8	176	.305	40.0	50.0	....	54.0	54.5	....	.02	.15	.66	3.75	.52	1.21	1.86	....	....	....
9	99	.172	40.0	47.8	....	47.5	54.0	....	0	.15	.08	3.75	.08	.55	3.70	....	....	....
10	168	.281	47.5	62.2	....	48.0	53.0	....	.08	.05	.04	2.52	.05	.38	3.55	....	....	....
11	139	.294	43.0	55.5	....	49.0	52.8	....	.22	.07	.03	.08	.03	.02	.35	....	....	....
12	63	.237	39.8	46.0	....	47.0	52.0	....	.12	.02	.01	.03	.02	.03	.62	....	....	....
13	94	.237	40.2	45.0	....	46.5	51.5	....	.03	—.02	.02	.02	.04	.06	.33	....	....	....
14	99	.205	40.8	45.5	....	46.0	51.0	....	0	.10	.03	.04	.01	.05	.20	....	....	7.4
15	117	.209	41.2	44.2	....	46.0	51.0	....	0	.08	.01	.03	.04	.03	0	....	....	....
16	93	.358	47.0	47.0	....	46.0	50.0	....	0	.05	.03	.02	.01	0	.02	....	....	....
17	160	.269	54.0	51.0	....	49.5	50.0	....	0	.04	.01	0	.02	.02	.03	....	....	....
18	170	.193	42.0	51.5	....	49.0	50.0	....	.04	.06	.02	.03	.01	.01	.02	....	....	....
19	113	.168	35.0	40.8	....	49.0	50.0	....	.03	—.03	0	0	.01	0	0	....	....	....
20	89	.156	31.5	39.2	....	43.0	49.5	....	.28	.10	.01	.01	0	0	0	....	....	....
21	163	.103	29.8	37.0	....	39.5	49.0	....	0	.03	.01	.01	0	0	0	....	....	6.7
22	256	.160	39.0	41.2	....	40.0	48.0	....	0	.06	0	.01	0	0	0	....	....	....
23	172	.235	46.2	49.8	....	43.0	47.0	....	0	.05	0	0	0	0	0	....	....	....
24	171	.135	34.5	42.0	....	40.0	47.0	....	0	.05	.02	0	.01	0	0	....	....	....
25	175	.141	38.5	42.0	....	40.0	46.5	....	0	.10	0	.01	0	0	0	....	....	....
26	149	.129	36.2	43.5	....	39.5	46.0	....	0	.10	.01	.01	0	0	.01	....	....	....
27	143	.221	43.0	39.8	....	43.0	46.0	....	.75	—.10	0	0	0	.01	0	....	....	....
28	259	.225	38.2	41.2	....	43.0	45.0	....	.24	.04	.18	.20	.16	.23	0	....	....	6.3
29	235	.143	32.8	37.0	....	40.0	45.0	....	0	.10	.12	.14	.17	.16	.13	....	....	....
30	140	.105	25.0	32.0	....	37.0	45.0	....	0	0	.04	.06	.05	.07	.13	....	....	....
31	104	....	34.8	34.5	....	36.5	44.0	....	0	.10	.04	.04	.01	.08	.06	....	....	....

T Trace.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of November, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				Clay, long grass.	Clay, short grass.	Clay and loam, bare.	Sand, long grass.	Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	160	.158	39.0	37.5	...	38.5	44.0	...	0	.05	.03	.02	.05	.04	.04	...	...	...
2	264	.265	44.2	43.0	...	45.0	44.0	...	.70	—.05	.19	1.12	.12	.10	.04	...	...	...
3	256	.207	39.2	35.5	...	42.5	44.0	...	.24	—.01	.26	1.82	.25	.65	1.82	...	...	...
4	167	.164	33.2	35.8	...	40.0	44.0	...	.02	.02	.14	2.83	.15	.74	3.35	...	...	3.0
5	169	.208	39.8	38.8	...	44.0	44.0	...	0	.10	.20	.15	.07	.56	1.08	...	...	...
6	183	.247	41.2	41.0	...	41.0	44.0	...	1.85	—.05	3.55	1.81	1.09	1.69	3.70	...	...	...
7	334	.179	33.8	37.8	...	40.0	43.0	...	.15	—.10	3.75	1.74	.51	1.67	3.70	...	...	...
8	168	.163	38.0	35.0	...	38.0	43.0	...	0	.05	2.60	3.70	.19	1.05	3.70	...	...	...
9	138	.197	43.5	38.2	...	44.5	43.0	...	0	.05	.43	3.70	.08	.93	3.70	...	...	...
10	100	.193	37.8	37.0	...	40.0	43.0	...	.04	.04	.04	3.70	.07	.87	3.70	...	...	...
11	113	.150	30.8	32.5	...	38.0	42.5	...	*.10	0	.03	1.87	.02	.75	1.70	...	...	6.0
12	134	.099	23.5	33.0	...	36.5	42.0	...	0	.05	.02	.55	.02	.22	.84	...	...	...
13	242	.091	29.2	31.5	...	34.5	42.0	...	0	0	.03	.03	.02	.08	.56	...	...	...
14	198	.089	24.0	...	...	34.0	41.0	...	*.03	†	0	.01	.01	.03	.07	...	...	...
15	98	.090	24.5	...	...	34.0	41.0	...	0	...	0	.01	0	0	0	...	...	...
16	101	.120	27.2	...	...	33.0	40.0	...	0	...	0	0	0	0	0	...	...	...
17	135	.142	33.0	...	...	33.0	40.0	...	0	...	.02	.01	0	0	0	...	...	...
18	113	.173	37.2	...	...	33.5	39.5	...	0	...	.01	.01	0	0	0	...	...	6.5
19	90	.184	33.8	...	...	34.5	39.0	...	0	...	0	0	0	0	0	...	...	...
20	243	.162	32.8	...	...	34.0	39.0	...	.11	...	0	0	0	0	0	...	...	...
21	183	.238	45.0	...	...	36.0	39.0	...	0	...	.02	.01	.03	.01	0	...	...	...
22	114	.211	39.2	...	...	40.5	39.0	...	0	...	.01	.01	.01	.04	.01	...	...	...
23	121	.163	33.8	...	...	40.0	39.0	...	0	...	0	.02	.03	.04	.04	...	...	...
24	45	.144	32.2	...	...	35.5	39.5	...	*.50	...	.01	.01	.01	.03	.03	...	...	...
25	160	.151	29.8	...	...	36.0	40.0	...	*.05	...	.02	.02	.02	0	.03	...	...	6.6
26	156	.151	29.5	...	...	34.5	40.0	...	*.18	...	0	.01	0	.01	.02	...	...	...
27	209	.159	30.2	...	...	35.0	39.5	...	.06	...	.01	.01	.02	0	0	...	...	...
28	214	.149	32.5	...	...	35.0	39.5	...	*.12	...	.05	.09	.02	.08	.05	...	...	...
29	65	.106	24.8	...	...	34.0	39.0	...	0	...	.12	.70	.18	.12	.05	...	...	...
30	225	.112	24.0	...	...	34.0	38.0	...	0	...	.08	.07	.08	.07	.45	...	...	...

* Snow. † Frozen up.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Concluded*).

Month of December, 1907.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				Clay, long grass.	Clay, short grass.	Clay and loam, bare.	Sand, long grass.	Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	162	.121	24.8	......	......	33	38	......	*.08	......	.05	.04	.03	.02	10	......	......	......
2	152	.107	22.2	......	......	33	38	......	*.02	......	.04	3.59	0	.25	2.65	......	......	6.6
3	59	.071	16.5	......	......	33	38	......	0	......	.01	.03	.01	0	.04	......	......	......
4	110	.059	10.2	......	......	33	38	......	0	......	.01	.01	0	0	0	......	......	......
5	71	.100	20.2	......	......	32.5	37	......	.04	......	0	0	0	0	0	......	......	......
6	150	.139	30.5	......	......	33	37	......	0	......	.03	0	0	0	0	......	......	......
7	132	.144	32.8	......	......	33	37	......	0	......	0	0	0	0	0	......	......	......
8	178	.128	39.2	......	......	33	37	......	0	......	0	0	0	0	0	......	......	......
9	223	.232	41.8	......	......	33	37	......	*.34	......	0	0	0	0	0	......	......	5.4
10	190	.244	41.5	......	......	40	37	......	*.18	......	3.56	3.71	.94	1.35	3.66	......	......	......
11	253	.095	23.5	......	......	35.5	37	......	*T	......	1.20	3.75	.16	.55	3.70	......	......	......
12	254	.084	19.0	......	......	34	37	......	0	......	.26	3.75	.04	.35	3.70	......	......	......
13	139	.084	21.0	......	......	33	37	......	0	......	.04	3.75	.02	.43	3.70	......	......	......
14	429	.102	23.5	......	......	33	37	......	*.45	......	.03	3.50	.01	.31	3.70	......	......	......
15	192	.133	28.2	......	......	33	37	......	*.11	......	.01	1.04	0	.24	1.40	......	......	......
16	248	.120	28.0	......	......	33	37	......	0	......	.01	.02	0	.10	.31	......	......	6.1
17	165	.109	25.8	......	......	33	37	......	*.02	......	.01	0	0	0	0	......	......	......
18	92	.076	22.5	......	......	33	36	......	*.02	......	0	0	0	0	0	......	......	......
19	228	.057	21.2	......	......	33	36	......	0	......	.01	0	0	0	0	......	......	......
20	149	.107	27.2	......	......	33	36	......	0	......	0	0	0	0	0	......	......	......
21	214	.117	26.8	......	......	33	36	......	0	......	0	0	0	0	0	......	......	......
22	195	.125	30.8	......	......	33	36	......	.45	......	0	0	0	0	0	......	......	......
23	273	.199	37.0	......	......	33	36	......	.31	......	3.33	3.73	0	.40	3.39	......	......	5.2
24	196	.134	30.5	......	......	33	36	......	0	......	3.70	3.75	0	.43	3.70	......	......	......
25	258	.106	26.8	......	......	33	36	......	*.05	......	.65	3.75	.01	.39	3.70	......	......	......
26	182	.121	29.2	......	......	33	36	......	0	......	.10	3.75	0	.31	3.70	......	......	......
27	293	.172	43.2	......	......	33	36	......	0	......	2.95	3.75	0	.42	3.70	......	......	......
28	271	.143	30.0	......	......	34.5	36	......	T	......	3.70	3.75	0	.45	3.70	......	......	......
29	213	.132	31.2	......	......	33	36	......	0	......	1.12	3.75	0	.28	3.70	......	......	......
30	318	.161	36.2	......	......	34	35	......	*.04	......	2.58	3.75	0	.38	3.70	......	......	5.3
31	362	.104	29.2	......	......	33	35	......	......	......	.33	3.75	0	.29	3.70	......	......	......

T means trace. * Snow.

NINE MILE CREEK AT POWELL'S BRIDGE, NEAR STITTVILLE, N. Y.

A gaging station was established at Powell's bridge, one mile below the village of Stittville, November 4, 1905, by C. A. Poole. Observations of the stage of the stream are taken each morning and afternoon by Mrs. Raymer Powell, from a weight-and-chain gage attached to the bottom chord on the down-stream side of the bridge.

The datum to which all gage readings are added is 481.72, and the elevation of bench-mark on west side of the bridge-seat of south abutment of bridge is 504.435.

Nine Mile creek drains a large portion of the territory on the north side of the Mohawk river between Utica and Rome, emptying into the latter stream near Oriskany. Its channel will be improved and used as a feeder for the diversion of water from West Canada creek to the summit level of the improved Erie canal, according to present plans. The drainage area above the station is 62.6 square miles.

A gaging station was maintained at this point by the U. S. Deep Waterways Commission during their survey in 1898. At that time there was a dam about 200 feet below the bridge, which has since been destroyed, leaving the flow unimpeded. The channel is of rock, of uniform cross-section and straight for several hundred feet each way from the bridge, and the conditions are very favorable for current-meter discharge measurements, which are made from the up-stream side of the bridge.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Nine Mile Creek near Stittville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	486.8	484.6	484.6	484.3	485.7	483.6	483.7	483.4	483.4	486.5	484.4	483.8
2	485.3	484.6	484.6	484.3	485.6	483.6	483.9	483.9	483.3	485.1	484.3	483.9
3	485.6	484.6	485.0	484.2	486.5	483.7	484.4	483.9	483.4	485.4	485.4	484.0
4	487.7	484.6	485.3	484.0	486.9	483.7	483.7	483.6	484.6	488.4	485.4	484.0
5	485.1	484.6	485.2	484.2	485.9	483.7	483.6	483.5	484.4	486.6	484.2	484.1
6	484.4	484.6	485.2	484.0	485.8	483.8	483.5	483.3	483.5	486.2	484.4	484.0
7	484.5	484.6	485.2	483.9	485.3	485.0	483.5	483.3	483.4	486.9	486.4	484.0
8	485.3	484.6	485.1	484.0	485.3	484.7	483.6	483.2	483.4	488.8	484.5	484.0
9	485.2	484.6	485.1	484.0	485.4	484.0	483.7	483.2	483.5	487.2	484.1	484.0
10	484.3	484.6	485.0	484.0	485.2	483.9	483.6	483.2	483.6	486.9	483.9	486.2
11	484.3	484.6	485.0	484.2	485.4	483.9	483.7	483.1	483.7	487.0	483.9	485.1
12	484.4	484.6	485.0	484.2	485.4	483.7	483.6	483.4	483.8	486.9	484.0	485.0
13	484.3	484.6	485.2	484.2	485.3	483.7	483.6	483.3	483.6	485.1	483.9	485.0
14	484.2	484.6	485.3	484.3	485.2	483.6	483.6	483.4	483.5	484.0	483.8	483.9
15	484.3	484.6	485.3	484.0	485.0	483.5	483.6	483.4	483.5	484.0	483.8	483.9
16	484.2	484.6	485.8	484.0	484.9	483.6	483.6	483.4	483.5	483.9	483.8	483.9
17	484.4	484.6	486.1	484.1	484.4	483.5	483.7	483.4	483.5	483.9	483.8	483.9
18	484.5	484.6	486.3	484.1	483.9	483.5	483.7	483.4	483.5	483.6	483.8	483.9
19	484.9	484.6	485.2	484.0	483.9	483.6	483.6	483.3	483.6	483.5	483.9	483.8
20	486.4	484.6	485.7	483.9	483.9	483.5	483.6	483.3	484.5	483.6	483.9	483.8
21	484.4	484.6	485.3	483.8	483.7	483.5	483.8	483.2	485.2	483.5	483.8	483.8
22	484.4	484.6	486.1	484.3	483.7	483.3	483.6	483.3	484.3	483.5	483.8	483.8
23	484.3	484.6	486.5	485.1	483.6	483.1	483.4	483.3	484.4	483.4	483.7	485.4
24	484.5	484.6	486.1	486.3	483.7	483.3	483.3	483.3	485.6	483.4	483.8	484.1
25	484.6	484.6	485.3	485.5	483.7	483.6	483.7	483.3	485.8	483.4	483.8	484.2
26	484.6	484.6	485.0	486.6	484.0	483.6	484.3	483.3	484.9	483.4	483.8	485.0
27	484.6	484.6	484.9	485.7	483.9	483.6	484.2	483.3	484.3	483.3	483.9	485.0
28	484.6	484.6	485.6	485.2	483.9	483.6	483.5	483.4	484.9	484.7	484.2	484.1
29	484.6	......	485.0	485.2	483.8	483.7	483.4	483.4	485.2	485.1	484.9	484.0
30	484.6	......	484.9	485.3	483.7	483.9	483.2	483.4	487.0	484.5	484.0	483.9
31	484.6	......	484.2	......	483.7	......	483.2	483.4	......	484.5	......	483.9

Current-meter Discharge Measurements of Nine Mile Creek near Stittville, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
Mar. 26..	McCormick and Cruger	3.20	......	125.0	2.96	370.0
April 4..	McCormick and Niles	2.40	......	64.2	1.17	75.3
April 9..	Horton and Niles	2.48	......	77.6	1.36	106.0
June 1..	E. F. Weeks	2.01	......	51.4	0.69	35.3
June 12..	E. C. Niles	1.96	......	48.0	0.58	28.4
July 19..	Weeks and Niles	1.84	......	43.1	0.51	21.8
Aug. 23..	E. C. Niles	1.70	......	34.4	0.21	6.75

MOHAWK RIVER BELOW STATE DAM AT ROME, N. Y.

A staff gage with painted tenth-foot marks is attached to the down-stream end of the right-hand abutment of the State feeder dam at Rome. The zero mark is at elevation 426.46. The crest of the dam is at elevation 431.22. Readings are taken each morning by John Phillips.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River below State Dam at Rome, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	433.0	428.9	428.6	430.1	430.1	429.0	429.1	428.9	......	429.7	429.3	......
2	430.5	428.9	428.8	429.9	429.3	......	429.9	428.9	428.1	429.4	429.[illegible]	429.2
3	429.7	......	......	429.7	429.5	429.0	429.7	428.3	428.2	429.1	......	429.1
4	436.2	428.9	428.6	429.7	432.0	429.0	429.3	......	428.9	431.5	430.2	428.9
5	431.1	428.9	428.6	429.7	......	429.0	428.9	428.3	429.5	430.3	429.9	428.9
6	430.0	428.8	428.7	429.6	429.5	431.5	428.5	428.3	429.3	......	429.9	428.7
7	430.2	428.8	428.7	......	429.5	431.4	......	428.3	428.9	430.5	434.5	428.7
8	431.6	428.7	428.7	429.6	429.1	429.5	428.1	428.2	......	432.2	430.9	......
9	430.7	428.7	428.8	429.5	429.1	......	428.1	428.2	428.5	430.3	430.8	429.1
10	430.3	......	......	429.6	429.9	429.2	428.3	428.2	428.7	429.9	......	434.1
11	430.0	428.7	428.7	429.8	429.5	429.1	428.5	......	429.9	430.2	430.2	431.1
12	430.0	428.7	428.8	430.0	......	429.0	428.9	428.3	429.9	430.2	429.7	430.5
13	......	428.7	429.4	430.2	429.1	429.0	428.8	428.2	429.7	......	429.4	429.1
14	429.2	428.8	429.4	......	428.8	428.9	......	428.1	428.5	430.0	429.4	429.1
15	429.2	428.7	429.5	429.5	428.8	428.7	428.3	428.1	......	429.7	429.4	......
16	429.2	428.7	429.8	429.3	428.9	......	428.3	428.2	428.7	429.2	429.0	429.2
17	429.1	......	......	429.5	428.5	428.5	428.3	428.2	428.9	428.8	......	429.2
18	429.1	428.7	429.7	429.5	428.5	428.5	428.7	......	428.7	428.9	429.1	429.1
19	429.1	428.7	429.9	429.5	......	428.3	428.5	428.2	428.7	428.9	429.1	429.1
20	431.4	428.8	431.1	429.5	429.1	428.3	428.5	428.2	428.5	......	429.2	429.1
21	430.0	428.7	430.5	......	429.1	428.2	......	428.1	428.9	428.9	429.3	429.1
22	430.0	428.6	430.3	429.2	429.1	428.2	428.3	428.2	......	428.9	429.4	......
23	429.5	428.6	......	429.2	429.0	......	428.7	428.2	428.9	428.9	429.4	429.2
24	429.5	......	433.0	431.5	428.8	428.3	428.5	428.2	429.1	428.8	......	431.2
25	429.5	428.6	431.0	430.0	428.5	428.3	429.4	......	429.3	428.8	429.2	433.5
26	429.4	428.7	431.0	430.5	430.5	428.3	429.7	428.1	429.4	428.8	429.1	430.5
27	......	428.7	431.0	430.5	429.5	428.3	429.3	428.1	429.2	......	429.1	429.3
28	429.2	428.7	434.7	......	429.5	428.3	......	428.1	429.1	434.3	429.2	430.5
29	429.1	......	431.5	429.0	429.1	428.3	428.9	428.1	......	431.3	429.2	......
30	429.0	......	431.2	429.0	429.0	......	428.9	428.1	430.1	430.5	429.2	431.5
31	428.9	......	......	......	429.0	......	428.9	428.1	......	429.5	......	430.7

MOHAWK RIVER ABOVE STATE DAM AT ROME, N. Y.

A vertical gage with painted tenth-foot marks is attached to a large elm tree in the entrance to the Erie canal feeder about 100 feet up-stream from the right-hand end of the State dam. Readings are taken each morning by John Phillips. The zero of the gage is at elevation 430.00.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River above State Dam at Rome, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	435.0	431.4	431.2	432.4	432.6	431.5	430.7	431.5	.....	432.3	431.9	.....
2	433.1	431.4	431.4	432.2	431.8	.....	432.5	431.5	430.2	432.0	431.9	431.8
3	432.[illegible]	.....	.....	432.2	432.1	431.6	432.3	431.0	430.2	431.7	.....	431.7
4	433.3	431.3	431.3	432.1	434.5	431.6	432.0	430.4	431.5	434.1	432.8	431.5
5	433.7	431.3	431.3	432.2	.....	431.6	431.4	430.4	432.1	432.7	432.4	431.5
6	432.5	431.2	431.3	432.1	432.1	434.1	430.8	430.3	431.8	.....	432.4	431.3
7	432.7	431.2	431.5	.....	432.1	434.0	.....	430.2	431.5	433.1	437.8	431.2
8	434.2	431.3	431.3	432.1	431.7	432.1	430.4	430.2	.....	431.8	433.5	.....
9	433.2	431.3	431.3	432.0	431.7	.....	430.5	430.2	431.1	432.9	433.4	431.7
10	432.8	.....	.....	432.1	432.5	431.8	430.6	430.2	431.3	432.5	.....	435.0
11	432.6	431.3	431.3	432.3	432.1	431.7	431.0	.....	432.5	432.8	432.6	433.7
12	432.5	431.3	431.4	432.5	.....	431.6	431.3	430.2	432.5	432.8	432.1	433.1
13	.....	431.2	431.9	432.7	431.7	431.5	431.2	430.2	432.2	.....	432.0	431.7
14	431.6	431.3	432.0	.....	431.7	431.5	.....	430.0	431.1	432.6	432.0	431.7
15	431.8	431.2	432.1	432.0	431.4	431.3	430.4	430.0	.....	432.3	432.0	.....
16	431.8	431.2	432.4	431.8	431.5	.....	430.4	429.9	431.3	431.8	431.6	431.8
17	431.7	.....	.....	432.0	431.0	431.1	430.5	429.9	431.4	431.4	.....	431.8
18	431.7	431.3	432.3	432.0	431.0	431.1	431.3	430.2	431.5	431.5	431.7	431.7
19	431.7	431.3	432.5	432.0	.....	430.9	430.5	429.8	431.3	431.5	431.7	431.7
20	434.0	431.4	433.7	432.0	431.7	430.8	430.5	429.9	431.1	.....	431.8	431.7
21	432.6	431.3	433.1	.....	431.5	430.7	.....	430.2	431.3	431.5	431.9	431.7
22	432.6	431.2	432.8	431.8	431.0	430.6	430.6	430.2	.....	431.5	432.0	.....
23	432.0	431.2	434.0	431.8	429.5	.....	431.2	430.2	431.5	431.5	432.0	431.8
24	432.0	.....	435.0	434.0	429.5	430.5	430.9	430.2	431.7	431.4	.....	433.1
25	432.0	431.2	433.3	432.5	429.5	430.4	432.0	.....	431.9	431.4	431.8	436.6
26	431.9	431.3	433.0	433.0	433.0	430.6	432.3	430.1	432.0	431.4	431.7	433.1
27	.....	431.3	433.0	433.0	432.1	430.7	431.9	430.0	431.8	.....	431.7	431.9
28	431.8	431.2	437.6	.....	432.1	430.6	.....	429.8	431.7	437.6	431.8	433.0
29	431.7	.....	433.8	431.5	431.7	430.6	431.6	429.8	.....	433.9	431.8	.....
30	431.6	.....	433.5	431.5	431.6	.....	431.5	429.8	432.5	433.1	431.8	433.1
31	431.5	.....	.....	.....	431.6	.....	431.5	429.8	.....	432.1	.....	433.3

MOHAWK RIVER AT FLOYD AVENUE, ROME, N. Y.

A box-and-chain gage was erected by E. F. Weeks, of this Department, at Riverside bridge crossing Mohawk river near Rome, July 9, 1907. The gage is attached to the up-stream hand-rail near the left-hand end of the bridge. The gage reads from zero to 7.5 feet. The standard chain length is 18.98 feet and the elevation of water-surface, when the gage reads zero, is 445.09. Readings are taken each morning and afternoon by Earl R. Williams. A bench-mark located at the junction of the up-stream wing wall and left-hand abutment is at elevation 460.80. The channel is spread for some distance up-stream and down-stream from the bridge. Current-meter measurements are made on the down-stream side, the initial point being the face of the right-hand abutment. A crude dam or barrier of boulders has been placed across the stream a few hundred feet down-stream for the purpose of raising the water-level to produce an ice pond.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Floyd Ave. Bridge, Rome, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	......	......	......	......	......	......	......	......	446.4	446.6	446.9	447.0
2	......	......	......	......	......	......	......	......	446.5	446.8	446.9	446.8
3	......	......	......	......	......	......	......	......	446.5	446.9	448.6	446.7
4	......	......	......	......	......	......	......	......	446.7	446.8	448.1	446.4
5	......	......	......	......	......	......	......	......	446.9	446.8	447.2	446.4
6	......	......	......	......	......	......	......	......	446.8	447.1	447.2	446.5
7	......	......	......	......	......	......	......	......	446.7	447.4	450.2	446.5
8	......	......	......	......	......	......	......	......	446.6	449.5	448.3	446.6
9	......	......	......	......	......	......	......	......	446.6	447.4	447.5	446.6
10	......	......	......	......	......	......	446.6	......	446.8	447.1	447.4	451.4
11	......	......	......	......	......	......	446.6	......	447.0	447.3	447.3	449.2
12	......	......	......	......	......	......	446.7	446.5	447.1	447.4	447.1	447.4
13	......	......	......	......	......	......	446.7	446.4	446.8	447.1	447.0	447.0
14	......	......	......	......	......	......	446.6	446.3	446.7	447.0	447.0	446.9
15	......	......	......	......	......	......	446.5	446.4	446.5	446.9	446.9	446.9
16	......	......	......	......	......	......	446.5	446.4	446.5	446.8	446.9	447.0
17	......	......	......	......	......	......	446.6	446.5	446.6	446.8	446.9	446.9
18	......	......	......	......	......	......	446.9	446.5	446.6	446.8	446.9	446.9
19	......	......	......	......	......	......	446.7	446.5	446.6	446.7	447.0	446.8
20	......	......	......	......	......	......	446.6	446.5	446.7	446.7	446.9	446.7
21	......	......	......	......	......	......	446.5	446.5	446.9	446.8	447.3	446.7
22	......	......	......	......	......	......	446.5	446.5	447.2	446.8	447.0	446.8
23	......	......	......	......	......	......	446.7	446.5	447.2	446.8	446.9	448.3
24	......	......	......	......	......	......	446.9	446.5	447.2	446.7	446.8	449.8
25	......	......	......	......	......	......	447.6	446.5	447.4	446.7	446.8	447.9
26	......	......	......	......	......	......	447.1	446.4	447.5	446.7	446.9	447.4
27	......	......	......	......	......	......	446.8	446.5	447.2	446.9	446.9	447.2
28	......	......	......	......	......	......	446.6	446.5	447.1	450.3	446.9	448.5
29	......	......	......	......	......	......	446.5	446.2	446.7	449.1	447.0	447.8
30	......	......	......	......	......	......	446.7	446.4	446.6	447.6	446.9	449.0
31	......	......	......	......	......	......	446.6	446.5	......	447.2	......	448.4

Current-meter Discharge Measurements of Mohawk River at Floyd Ave. Bridge, Rome, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
July 9	E. F. Weeks and E. C. Niles	1.60	......	341.0	0.72	244
July 25	E. C. Niles	2.97	......	481.9	2.55	1,230
Aug. 14	E. F. Weeks	1.25	......	289.1	0.45	132
Aug. 20	E. C. Niles	1.42	......	311.3	0.44	137
Aug. 23	E. F. Weeks	1.32	......	292.6	0.48	141
Sept. 5	E. F. Weeks	1.68	......	321.5	0.86	278
Sept. 20	E. C. Niles	1.40	......	321.8	0.55	178
Nov. 8	E. C. Niles	3.18	......	557.4	2.82	1,570
Nov. 8	E. C. Niles	3.15	......	557.4	2.71	1,510
Nov. 8	E. C. Niles	2.94	......	536.9	2.53	1,358
Nov. 8	E. C. Niles	2.92	......	536.9	2.39	1,284
Nov. 9	E. C. Niles	2.70	......	515.9	1.97	1,015
May 20	Horton and Niles	1.66	......	346.0	0.44	152
June 8	E. C. Niles	1.81	......	398.0	1.04	415
Oct. 8	E. F. Weeks	6.10	......	833.0	5.53	4,605

MOHAWK RIVER BELOW DAM AT RIDGE MILLS, N. Y.

Ridge Mills is located on Mohawk river two miles north of Rome, N. Y. The dam and water-power are utilized in conjunction with the Municipal Water Works Pumping Station. The gage was established at the lower line of the city property May 3, 1904. The gage is a vertical staff attached to a tree on the right-hand bank of the Mohawk river one-third mile below the dam. The gage zero is at elevation 454.79. A reading is taken each morning by Daniel Brown.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River below Dam at Ridge Mills, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	460.3	456.4	456.7	456.7	457.5	456.1	456.1	455.7	455.5	456.0	456.2	456.1
2	457.5	456.2	456.8	456.1	456.3	455.9	456.6	455.8	455.5	456.1	456.0	456.0
3	456.6	456.2	457.0	456.1	456.1	455.9	456.2	455.6	455.6	455.8	458.3	455.8
4	462.8	456.2	457.2	456.1	456.5	456.0	455.9	455.5	457.0	458.3	458.1	455.8
5	458.5	456.2	457.1	456.2	457.3	456.0	455.7	455.6	457.1	457.0	456.8	455.4
6	457.1	456.2	457.0	456.2	456.4	458.5	455.7	455.6	457.0	456.5	456.5	456.1
7	457.2	456.2	456.8	455.9	456.3	457.2	455.7	455.5	455.8	457.0	462.3	455.8
8	458.7	456.2	457.0	456.1	456.3	456.4	455.6	455.6	455.7	461.3	458.4	455.9
9	457.4	456.2	456.9	456.1	456.1	456.2	455.6	455.6	455.7	457.5	457.5	455.8
10	456.1	456.2	456.3	456.3	456.4	456.0	455.6	455.5	455.7	456.5	456.9	462.1
11	456.1	456.2	456.6	456.1	456.4	456.0	455.6	455.6	456.6	456.4	456.8	460.6
12	456.0	456.1	456.9	456.6	456.6	455.9	455.8	455.6	457.4	457.0	456.5	456.9
13	456.0	456.2	457.1	456.2	456.6	455.8	455.8	455.5	456.0	456.5	456.5	456.0
14	455.9	456.2	457.3	456.6	456.0	455.9	455.7	455.2	455.9	456.4	456.5	456.2
15	455.8	456.3	457.6	456.2	456.1	455.7	455.6	455.5	455.6	456.2	456.5	456.5
16	455.8	456.2	457.7	456.1	456.0	455.7	455.6	455.5	455.7	456.0	456.3	456.5
17	456.5	456.3	457.5	456.1	455.9	455.7	455.8	455.6	455.7	456.0	456.1	456.1
18	456.1	456.2	457.6	456.3	455.9	455.6	455.7	455.6	455.7	456.0	456.2	456.1
19	456.1	456.3	456.9	456.0	455.8	455.6	455.6	455.5	455.6	456.0	456.1	456.1
20	457.2	456.3	457.3	456.0	455.9	455.7	455.7	455.6	455.6	456.0	456.2	456.1
21	456.5	456.2	456.7	456.0	455.8	455.7	455.6	455.6	455.6	456.2	456.2	456.0
22	456.1	456.2	457.4	456.0	455.7	455.6	455.6	455.5	455.6	456.0	456.4	456.0
23	455.8	456.2	459.9	455.8	455.7	455.7	456.1	455.5	455.7	455.9	456.1	455.9
24	456.2	456.3	460.3	458.8	455.6	455.7	455.6	455.5	456.1	456.0	456.1	461.5
25	456.2	456.4	458.2	456.6	455.6	455.7	457.8	455.5	456.1	455.9	456.2	457.6
26	456.3	456.5	458.1	456.8	455.6	455.7	456.1	455.5	456.6	455.9	456.1	457.0
27	456.4	456.5	458.3	457.9	456.6	455.6	456.0	455.5	455.8	455.9	456.0	456.5
28	456.4	456.6	461.7	456.6	456.8	455.7	454.9	455.5	455.7	461.3	456.1	458.5
29	456.4	.....	459.1	456.2	456.1	455.7	454.9	455.5	456.1	457.5	456.0	457.5
30	456.3	.....	458.8	456.1	456.1	455.9	454.9	455.6	457.0	456.6	456.5	456.8
31	456.2	.....	457.3	.....	456.1	.....	454.9	455.5	.....	456.5	.....	458.5

MOHAWK RIVER ABOVE DAM AT RIDGE MILLS, N. Y.

The gage is attached to the up-stream face of the left-hand abutment of the dam. The zero mark was at elevation 464.63 preceding January 22, 1907, and at elevation 465.00 after that date. Readings are taken each morning by Daniel Brown. The stage of the stream above the dam is affected by diversion to the turbines in the adjacent pumping station. Black River canal runs parallel to Mohawk river at this point. Current-meter measurements, to determine the volume of flow in the canal, are shown in the accompanying table.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River above Dam at Ridge Mills, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	468.4	465.7	465.4	466.6	467.0	466.2	466.2	465.9	465.6	466.2	466.3	466.8
2	467.1	465.7	465.5	466.2	466.4	466.1	466.6	466.0	465.6	466.2	466.2	466.2
3	466.6	465.7	465.8	466.1	466.2	466.1	466.3	465.8	465.8	466.0	467.5	466.0
4	469.6	465.8	466.0	466.1	466.5	466.2	466.1	465.7	466.1	467.2	467.4	465.6
5	467.4	466.0	465.9	466.3	466.9	466.2	465.9	465.8	466.2	466.7	466.6	465.3
6	466.7	465.4	466.0	466.3	466.5	467.5	465.9	465.7	466.1	466.5	466.5	465.9
7	466.8	465.4	465.8	466.0	466.4	466.7	465.9	465.7	466.0	466.7	469.2	465.7
8	467.6	465.2	466.0	466.2	466.4	466.4	465.8	465.7	465.9	468.8	467.5	465.8
9	466.9	465.8	465.8	466.3	466.3	466.3	465.8	465.7	465.9	467.4	467.0	465.9
10	466.3	465.2	466.0	466.4	466.5	466.2	465.8	465.5	465.9	466.5	466.7	469.0
11	466.3	465.2	465.9	466.2	466.4	466.2	465.7	465.6	466.5	466.4	466.6	467.5
12	466.3	465.2	466.1	466.6	466.6	466.1	466.0	465.6	467.0	466.7	466.5	466.7
13	466.1	465.2	466.2	466.3	466.6	466.0	466.0	465.6	466.2	466.4	466.5	466.2
14	466.1	465.2	466.2	466.6	466.1	466.0	465.9	465.3	466.1	466.4	466.5	466.3
15	466.1	465.5	466.5	466.3	466.3	465.9	465.8	465.0	465.8	466.3	466.2	466.5
16	466.3	465.5	466.3	466.2	466.1	465.9	465.7	465.0	465.8	466.2	466.3	466.5
17	465.8	465.4	466.2	466.3	466.1	465.9	466.0	465.6	465.9	466.3	466.3	466.3
18	466.0	465.2	466.4	466.4	466.1	465.9	465.8	465.6	465.9	466.1	466.3	466.3
19	466.0	465.2	467.0	466.2	466.0	465.9	465.9	465.0	465.8	466.1	466.4	466.3
20	466.8	465.2	467.4	466.2	466.1	465.9	465.9	465.0	465.7	466.1	466.3	466.3
21	......	465.3	467.2	466.2	466.0	465.9	465.8	465.2	465.8	466.3	466.3	466.2
22	466.5	465.2	467.1	466.2	465.9	465.8	465.7	465.0	465.7	466.2	466.4	466.2
23	466.3	465.3	468.2	466.0	465.9	465.8	466.3	465.0	465.8	466.1	466.3	466.2
24	465.7	465.1	468.5	467.7	465.8	465.8	465.8	465.0	466.1	466.1	466.3	469.0
25	466.0	465.2	467.5	466.6	465.8	465.9	467.5	465.4	466.1	466.1	466.3	467.0
26	466.2	465.3	467.4	466.7	465.8	465.9	466.4	465.0	466.5	466.1	466.3	466.8
27	465.6	465.1	467.5	467.2	466.5	465.9	466.3	465.0	466.0	466.1	466.2	466.5
28	466.0	465.2	469.0	466.5	466.7	465.9	466.0	465.5	465.9	469.0	466.3	467.6
29	465.7	......	467.8	466.3	466.3	465.8	466.0	465.7	466.1	467.0	466.2	467.0
30	466.0	......	467.7	466.2	466.2	466.0	466.0	465.6	466.7	466.6	466.5	466.6
31	465.9	......	467.0	......	466.3	......	466.0	465.6	......	466.5	......	467.5

Current-meter Discharge Measurements of Black River Canal at Ridge Mills, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
June 8	E. C. Niles	......	......	146	......	116
July 9	Weeks and Niles	......	......	151	......	134
Aug. 23	E. F. Weeks	......	......	145	......	119
Sept. 20	E. C. Niles	......	......	152.0	......	112
Nov. 26	E. C. Niles	......	......	163.0	......	84.3

MOHAWK RIVER NEAR DELTA, N. Y.

A current-meter gaging station was established at the highway bridge over the Mohawk river just below Lock No. 7, Black River canal, and about two miles below Delta, August 20, 1905, by C. A. Poole. The gage is a vertical board, graduated to feet and tenths, and is secured to the south wing of the east abutment of bridge with its zero at elevation 479.0. Observations of the stage of the stream are taken each morning and evening by Fred Miller.

During ordinary stages of the river, discharge measurements have been made from the bridge, which consists of one span of 101.6 feet. In low water the measurements are made by fording the stream about 1,000 feet above the bridge, where there is a straight channel of uniform cross-section. The channel at the bridge is of gravel and of uniform section directly under the bridge, but there is a small island about 150 feet up-stream, which affects the flow during the low stages.

The yield of the watershed above this point is influenced considerably by the Black River canal, which receives its initial supply from the Black river watershed and an additional supply from the Mohawk river at Delta. The diversion at Delta is in some measure counterbalanced by the water which returns to the river from seepage through the canal banks and flow over waste-weirs.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River near Delta, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	483.5	479.8	479.8	480.9	481.3	480.2	480.3	480.0	479.8	480.5	480.4	480.6
2	481.5	479.8	480.0	480.5	480.6	480.2	480.6	480.2	479.8	480.2	480.4	480.2
3	481.0	480.0	480.2	480.4	480.6	480.2	480.3	480.2	480.0	480.0	482.6	480.2
4	480.2	480.2	480.2	480.4	482.0	480.2	480.2	480.0	480.5	483.0	481.7	479.8
5	481.8	480.6	479.8	480.6	481.2	480.4	480.0	480.0	480.2	481.0	481.0	480.0
6	481.2	479.8	480.0	480.3	480.7	482.2	480.0	479.9	480.2	480.6	480.8	480.0
7	481.4	479.9	479.8	480.2	480.6	481.3	480.0	479.9	480.0	481.2	484.8	480.0
8	482.1	480.0	480.0	480.2	480.6	480.6	479.9	479.9	480.0	484.9	482.1	480.0
9	481.3	480.0	479.6	480.4	480.6	480.4	480.0	479.9	480.0	481.4	481.4	480.0
10	480.6	479.6	479.7	480.4	480.6	480.3	479.8	479.8	480.0	480.8	481.0	482.4
11	480.6	479.8	479.8	480.4	481.1	480.2	480.0	479.8	482.5	480.9	480.9	482.0
12	480.4	479.6	479.8	480.6	480.7	480.2	480.1	479.9	482.4	481.2	480.6	481.0
13	480.3	479.8	479.8	480.6	480.6	480.2	480.1	479.7	480.4	480.8	480.6	480.6
14	480.3	479.8	480.2	480.8	480.3	480.2	480.0	479.8	480.1	480.4	480.6	480.6
15	480.4	479.7	480.8	480.2	480.2	480.0	479.9	479.7	480.0	480.4	480.6	480.5
16	480.2	479.6	480.6	480.2	480.2	480.0	479.9	479.6	479.8	480.4	480.4	480.5
17	480.2	479.6	480.3	480.4	480.3	480.0	480.2	479.8	479.8	480.4	480.4	480.4
18	480.0	479.6	481.0	480.4	480.2	480.0	480.3	479.8	480.0	480.2	480.4	480.2
19	480.0	480.2	480.6	480.3	480.0	480.0	480.1	479.7	480.0	480.2	480.4	480.1
20	482.8	479.9	482.1	480.2	480.2	480.0	480.0	479.8	480.0	480.2	480.4	480.2
21	480.8	479.6	481.6	480.0	480.0	480.0	480.0	479.8	480.2	480.4	480.8	480.2
22	480.4	479.5	482.5	480.0	480.0	480.0	479.9	479.7	480.0	480.3	480.8	480.2
23	480.0	479.6	484.5	480.0	480.1	480.0	480.2	479.6	480.0	480.2	480.6	482.2
24	480.0	479.9	484.1	482.0	479.8	480.0	480.1	479.7	480.2	480.2	480.4	483.8
25	480.0	479.8	482.4	480.8	479.8	480.0	481.2	479.7	480.2	480.2	480.4	481.4
26	479.8	480.0	482.8	482.6	480.4	480.0	480.3	479.6	480.6	480.2	480.5	481.0
27	479.8	480.0	482.8	481.4	480.8	480.0	480.3	479.6	480.0	480.9	480.4	481.0
28	480.0	481.0	485.0	480.8	480.7	480.0	480.2	479.6	480.2	483.4	480.4	482.5
29	480.0	......	482.7	480.6	480.2	480.0	480.0	479.6	480.2	481.4	480.8	481.2
30	480.0	......	482.4	480.4	480.3	480.0	480.2	479.8	481.0	480.8	480.6	482.6
31	480.0	......	481.4	......	480.2	......	480.1	479.8	......	480.5	......	481.8

MOHAWK RIVER BELOW DAM AT DELTA, N. Y.

A vertical staff gage was erected on the down-stream end of the feed mill on the right-hand bank of the Mohawk river below dam at Delta, May 3, 1904. The gage is divided to feet and tenths by coppered staples and reads from zero to nine feet. Readings of this gage and also of the gage above the dam are taken each morning by E. A. Evans. The zero mark of the gage below the dam is at elevation 502.00.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River below Dam at Delta, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	......	......	......	503.8	504.3	503.0	503.1	503.0	......	503.3	503.2	503.3
2	......	......	......	503.1	503.3	503.0	503.5	502.9	......	502.9	503.0	503.0
3	......	......	......	503.2	503.2	502.9	503.0	502.7	502.6	502.8	505.3	502.9
4	......	......	......	503.2	505.2	502.9	502.9	502.6	503.3	506.3	504.8	502.8
5	......	......	......	503.3	504.1	503.2	502.7	502.7	503.0	503.7	503.6	502.8
6	......	......	......	503.3	503.6	505.3	502.7	502.6	503.0	503.3	503.5	502.8
7	......	......	......	503.0	503.4	504.1	502.7	502.6	502.9	503.8	507.9	502.8
8	......	......	......	503.1	503.5	503.4	502.7	502.6	502.8	508.6	505.1	502.9
9	......	......	......	503.2	503.2	503.1	502.7	502.6	502.8	504.3	504.3	503.1
10	......	......	......	503.2	503.5	503.0	502.6	502.6	502.9	503.9	503.7	509.8
11	......	......	......	503.2	503.5	503.0	502.6	502.6	504.7	503.4	503.6	505.3
12	......	......	......	503.5	503.5	503.0	502.9	502.6	504.0	503.7	503.5	503.8
13	......	......	......	503.3	503.2	502.9	502.9	502.5	503.1	503.4	503.3	503.1
14	......	......	503.0	503.6	503.0	502.8	502.7	502.6	502.9	503.0	503.2	503.1
15	......	......	503.3	503.2	502.9	502.7	502.6	502.5	502.8	503.2	503.2	503.0
16	......	......	503.3	503.1	502.9	502.7	502.6	502.6	502.8	503.1	503.1	503.0
17	......	......	503.0	503.2	503.1	502.7	502.9	502.7	502.7	503.0	503.1	503.1
18	......	......	503.5	503.2	502.9	502.7	502.9	502.6	502.8	503.1	503.1	503.0
19	......	......	503.7	503.0	502.9	502.7	502.8	502.6	502.7	502.9	503.1	503.0
20	505.5	......	505.1	503.1	502.9	502.8	502.7	502.6	502.7	503.0	503.2	502.9
21	503.3	......	503.9	502.9	502.9	502.7	502.6	502.6	502.8	503.1	503.2	503.0
22	502.9	......	505.4	502.9	502.9	502.7	502.6	502.6	502.7	502.9	503.2	503.0
23	......	......	506.3	502.9	502.7	502.6	503.0	502.5	502.7	503.0	503.1	506.0
24	......	......	507.1	505.5	502.6	502.6	502.7	502.5	502.9	503.1	503.1	506.7
25	......	......	504.8	503.5	502.6	502.7	504.6	......	502.8	503.0	503.1	504.2
26	......	......	504.7	505.5	502.7	502.6	503.1	......	503.4	502.9	503.0	503.7
27	......	......	506.7	504.5	503.4	502.7	503.0	......	502.9	502.9	503.0	503.6
28	......	......	507.5	503.6	503.7	502.7	502.7	......	503.0	505.8	503.0	504.8
29	......	......	505.5	503.3	503.1	502.6	502.7	......	503.2	504.3	503.3	504.3
30	......	......	505.3	503.2	503.1	502.8	502.7	......	503.7	503.6	503.3	505.6
31	......	......	504.2	......	503.2	......	502.7	......	......	503.3	......	505.3

MOHAWK RIVER ABOVE DAM AT DELTA, N. Y.

The gage above the dam was established May 3, 1904. The gage is attached to the face of the right-hand abutment. It is subdivided to tenths of feet by coppered staples and reads from 1.5 feet to 4 feet. The flow of the stream is utilized in the adjacent mills and in addition diversion is made to the Black River canal during the navigation season through the Delta feeder. The zero mark of the gage above the dam is at elevation 507.63. The crest of the dam is at elevation about 509.4.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River above Dam at Delta, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	511.0	509.1	509.0	509.4	509.9	509.3	509.4	509.4	509.0	509.4	509.4	509.4
2	509.9	509.2	509.0	509.4	509.6	509.3	509.6	509.3	509.0	509.2	509.3	509.3
3	509.6	509.2	509.2	509.4	509.4	509.3	509.4	509.1	509.1	509.2	510.2	509.3
4	512.1	509.3	509.2	509.4	510.2	509.3	509.2	509.1	509.4	510.6	510.1	509.1
5	510.2	509.2	509.1	509.5	509.9	509.4	509.2	509.1	509.3	509.8	509.6	509.1
6	509.7	509.1	509.1	509.5	509.6	510.2	509.2	509.1	509.3	509.5	509.5	509.2
7	509.8	509.0	509.0	509.3	509.5	509.8	509.1	509.1	509.2	509.8	511.0	509.2
8	510.2	509.1	509.0	509.4	509.6	509.5	509.1	509.1	509.2	511.3	510.1	509.2
9	509.9	509.1	509.0	509.4	509.5	509.4	509.1	509.1	509.1	509.9	509.9	509.3
10	509.4	509.1	509.0	509.4	509.6	509.3	509.1	509.1	509.2	509.6	509.6	511.6
11	509.5	509.1	508.9	509.4	509.6	509.3	509.1	509.0	510.0	509.5	509.6	509.2
12	509.4	509.0	509.0	509.6	509.6	509.3	509.3	509.0	509.8	509.6	509.6	509.8
13	509.4	508.9	509.0	509.5	509.5	509.3	509.3	509.0	509.4	509.5	509.5	509.4
14	509.4	509.1	509.2	509.6	509.3	509.2	509.1	509.0	509.3	509.3	509.4	509.5
15	509.5	509.0	509.5	509.4	509.5	509.2	509.1	508.9	509.2	509.4	509.4	509.4
16	509.2	509.1	509.5	509.4	509.3	509.2	509.1	509.0	509.2	509.3	509.4	509.4
17	509.1	509.1	509.3	509.4	509.4	509.2	509.3	509.1	509.1	509.3	509.4	509.5
18	509.3	509.1	509.6	509.4	509.3	509.2	509.3	509.1	509.2	509.3	509.4	509.4
19	509.3	509.0	509.8	509.3	509.3	509.2	509.2	509.1	509.1	509.2	509.4	509.4
20	510.2	509.0	510.2	509.3	509.3	509.2	509.1	509.0	509.1	509.3	509.4	509.4
21	509.6	509.0	510.0	509.2	509.2	509.2	509.0	509.0	509.2	509.4	509.4	509.4
22	509.4	509.0	510.4	509.2	509.2	509.2	509.0	509.0	509.1	509.2	509.4	509.3
23	509.1	509.0	510.6	509.3	509.2	509.2	509.4	509.0	509.1	509.2	509.4	510.4
24	509.1	509.0	510.9	510.4	509.1	509.1	509.2	509.0	509.4	509.2	509.4	510.7
25	509.2	509.0	510.1	509.6	509.1	509.2	510.0	[a]	509.3	509.2	509.4	509.9
26	509.2	509.0	510.0	510.3	509.2	509.1	509.4	[a]	509.5	509.1	509.4	509.7
27	509.2	509.0	510.9	510.0	509.5	509.2	509.3	[a]	509.2	509.3	509.4	509.6
28	509.1	509.0	511.1	509.6	509.7	509.2	509.2	508.8	509.2	510.4	509.3	510.1
29	509.1	......	510.3	509.5	509.4	509.1	509.1	508.8	509.3	510.0	509.5	509.9
30	509.1	......	510.2	509.4	509.4	509.2	509.1	508.9	509.6	509.6	509.5	510.4
31	509.0	......	509.8	......	509.5	......	509.2	508.9	......	509.4	......	510.2

[a] No record.

UPPER HUDSON RIVER DRAINAGE BASIN.

DESCRIPTION.

Upper Hudson river comprises the drainage basin above tide-water influence at Troy and also above the mouth of Mohawk river at Waterford.

The head-water region is mountainous in character, in general heavily wooded, and dotted with numerous lakes and ponds. The rocks, belonging to the oldest formation and mainly granitic, are either bare or covered with only a layer of spruce duff, humus and forest litter. The river emerges from the mountain region a few miles west of Glens Falls, and thence to Troy the topography is moderately rolling and the surface soil is chiefly sand.

The fall in the upper portion of the course is very rapid, amounting to about 64 feet per mile from Lake Tear-of-the-

Clouds to North creek, a distance of about 52 miles. From the mouth of North creek to the mouth of the Sacandaga the descent is nearly 14 feet per mile, distributed among rapids which diminish in frequency as the Sacandaga is approached. In the succeeding 26 miles to Fort Edward the river descends 418 feet more, but of this 175 feet is comprised within the three abrupt pitches at Palmer, Glens and Bakers falls, while most of the remainder occurs in the rapids between Jessups Landing and the oxbow above Glens Falls. Between Glens Falls and Troy nearly the entire fall of the river is utilized for the development of water-power.

The flow of the upper Hudson is controlled to some extent during the dry season by the use of Indian lake storage reservoir, and the facilities for storage works in this part of the basin are unsurpassed. The entire region is dotted with ponds and lakes, many of them of large size and fed from extensive drainage areas. Saratoga lake serves as a regulator of Fish creek, and there is a small reservoir at the head waters of the Hoosic.

Gaging stations have been maintained on the upper Hudson river in 1907 at various stations for the purpose of determining the water-surface elevation. In addition records are kept at Mechanicville, Fort Edward and Corinth, from which the discharge is determined.

HUDSON RIVER BELOW STATE DAM, TROY, N. Y.

This gage was established January 19, 1903, by E. A. Lamb. The present gage is vertical and is in two sections. The lower section, reading from zero to 13 feet, is attached to the face of the wall of the sloop lock at the left-hand, or Troy end of the dam. The upper section, reading from 13 to 21 feet, is painted on the down-stream end of the same wall. The gages are below the lower miter gates and are on the side of the lock adjoining the timber crib forming the dam abutment. A third section, reading from 20 to 24 feet, is attached to the southwest corner of Orr & Co.'s paper mill. The gages at the State dam at Troy are maintained in coöperation with the U. S. Weather Bureau. The readings are taken each morning and afternoon by John B. Mackey. The zero mark of the gage below the dam is at elevation 0.084. The gages are referred to a bench-mark consisting of a copper plug in the top of the lock wall between the anchors of the southwest gate. Elevation of the bench-mark is 21.564.

The water level is affected both by tides and by the flow in the river.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River below State Dam at Troy, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	4.2	5.4	4.9	15.0	9.2	5.2	3.4	3.6	1.8	6.2	7.9	6.0
2	4.4	5.2	4.4	15.7	9.6	5.2	3.7	3.8	3.1	5.9	7.8	5.1
3	6.1	5.3	4.1	15.3	9.2	5.0	4.2	3.5	2.8	5.7	8.2	4.8
4	14.8	5.1	4.4	14.8	9.1	5.3	4.0	3.8	3.8	5.3	8.1	4.9
5	12.8	5.3	4.3	12.4	9.2	5.2	3.8	3.4	4.0	5.3	8.8	4.9
6	11.8	5.1	4.3	9.8	9.0	5.4	4.0	3.4	3.8	5.3	10.0	4.8
7	11.2	5.1	4.1	7.9	8.4	5.7	3.8	3.2	4.1	5.7	13.7	4.2
8	10.8	5.0	4.1	7.4	8.0	5.2	3.7	3.2	4.2	5.5	17.9	4.2
9	10.1	5.3	3.9	7.4	8.0	5.2	3.8	3.5	3.8	6.2	15.6	4.7
10	9.6	5.0	4.3	7.2	7.8	5.2	3.4	3.4	4.1	5.7	12.9	6.4
11	8.9	4.8	4.4	7.4	8.0	5.3	3.8	3.4	3.9	6.0	9.2	14.2
12	6.2	4.2	4.7	7.7	7.8	5.3	4.0	3.5	3.8	6.2	9.8	13.7
13	6.6	3.9	5.4	7.2	7.6	5.4	4.2	3.0	4.1	6.4	9.0	13.2
14	6.2	4.3	6.3	7.3	7.8	5.4	4.3	2.9	3.7	6.0	8.2	12.3
15	6.7	4.1	8.3	7.2	7.4	5.3	4.1	3.3	4.0	6.0	7.0	10.3
16	6.9	4.4	9.9	7.6	7.4	5.4	3.8	3.1	4.4	5.4	7.0	7.7
17	7.2	4.7	9.1	7.8	7.6	5.2	3.4	2.9	4.6	5.4	6.8	7.3
18	7.1	4.9	9.1	7.3	7.5	5.5	3.2	0.9	4.4	5.3	6.1	7.2
19	7.5	4.7	9.2	7.6	7.6	5.1	3.5	2.5	4.2	5.2	5.9	6.8
20	7.9	5.0	9.3	7.4	7.7	5.1	3.8	2.8	4.0	5.3	5.4	6.8
21	7.4	5.1	9.3	7.7	7.4	5.0	3.8	3.4	3.5	4.8	5.1	6.6
22	7.1	4.9	9.4	7.4	7.1	5.0	3.9	3.0	3.3	4.7	5.0	6.4
23	6.9	4.8	8.5	8.3	7.2	4.9	4.0	3.4	5.1	5.0	4.7	7.3
24	6.3	4.5	9.1	8.4	6.8	4.2	3.9	2.8	5.3	4.8	4.4	8.0
25	5.7	4.4	10.3	9.8	6.8	3.9	3.7	2.6	5.0	4.9	5.2	7.7
26	6.1	4.8	11.9	10.0	6.4	3.9	3.7	3.1	5.1	5.0	5.2	7.3
27	6.9	5.1	16.4	11.2	6.8	4.1	3.4	2.8	5.1	4.0	5.2	7.0
28	6.0	5.4	15.9	11.6	6.2	3.8	3.0	3.4	5.1	4.4	5.0	7.8
29	5.8	.....	15.7	10.2	6.3	4.1	3.5	3.5	5.2	5.5	4.7	8.8
30	6.0	.....	15.5	9.8	5.8	4.0	3.2	4.1	5.8	7.7	5.1	9.3
31	6.1	.....	14.7	.....	5.8	.....	3.5	3.7	.....	9.0	.....	8.7

HUDSON RIVER ABOVE STATE DAM, TROY, N. Y.

This gage was established November 15, 1904, by C. A. Poole, and it is in two sections. The lower portion, reading from 3 to 12 feet, is attached to the timber crib forming the left-hand abutment of the dam. The gage is just up-stream from the sloop lock on the canal side of the crib. The upper section of the gage, reading from 12 to 16 feet, is attached to a tree growing on the earth filling of the timber crib. Elevation of water-surface, when the gage reads zero, equals 9.444. The water-level is affected both by the volume of flow and by the use of water in the adjoining mills.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above State Dam at Troy, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	16.4	14.8	15.5	20.2	17.6	15.2	15.5	15.0	15.4	15.4	16.4	15.1
2	16.4	14.9	15.1	20.3	17.4	15.2	15.4	15.2	15.4	15.3	16.3	15.1
3	17.3	14.9	15.1	20.0	17.6	15.1	15.4	15.3	15.5	15.3	16.4	15.0
4	20.3	15.0	15.1	17.4	17.6	15.1	15.4	15.4	16.0	15.3	16.7	15.0
5	19.7	15.0	15.0	17.4	17.4	15.2	15.3	15.6	16.1	15.3	16.9	15.0
6	18.4	15.0	15.0	16.6	17.4	15.2	15.3	15.6	16.2	15.4	17.2	14.9
7	17.9	15.0	15.1	16.6	17.2	15.2	15.4	15.5	16.4	15.4	18.3	14.9
8	17.9	15.1	15.2	16.5	17.0	15.3	15.3	15.4	16.4	15.3	20.9	15.2
9	17.4	15.1	15.1	16.4	16.9	15.3	15.3	15.3	16.3	15.7	19.9	15.3
10	17.3	15.1	15.3	16.4	16.8	15.3	15.2	15.1	16.4	15.9	19.2	16.2
11	16.8	15.1	15.5	16.3	16.8	15.4	15.3	15.0	16.3	16.0	18.3	17.8
12	15.9	15.0	16.0	16.4	16.4	15.4	15.4	15.0	16.4	16.0	17.2	17.8
13	15.9	15.1	16.6	16.2	15.9	15.3	15.5	14.9	16.3	16.1	16.7	17.5
14	15.5	15.2	16.9	16.2	15.8	15.4	15.5	14.9	16.3	15.9	16.4	17.2
15	15.7	15.2	17.2	16.2	15.9	15.4	15.4	15.0	16.2	15.6	16.0	16.5
16	15.3	15.2	17.4	16.2	15.8	15.4	15.3	14.9	15.7	15.3	16.0	15.9
17	15.3	15.3	17.4	16.2	15.8	15.3	15.3	14.9	15.3	15.1	14.9	15.9
18	15.0	15.4	17.4	16.2	15.8	15.2	15.4	15.1	14.5	15.0	15.1	15.8
19	15.2	15.4	17.5	16.0	15.8	15.2	15.4	15.1	14.2	15.0	15.7	15.8
20	15.2	15.6	17.6	16.0	15.8	15.1	15.4	15.1	14.0	15.0	15.6	15.7
21	15.3	15.7	17.5	16.6	15.8	15.1	15.6	15.0	14.0	15.0	15.4	15.6
22	15.2	15.7	17.5	18.2	15.7	15.0	15.3	15.1	13.9	15.1	15.4	15.6
23	15.2	15.7	17.7	18.9	15.8	15.1	15.1	15.1	14.7	15.0	15.3	16.0
24	15.0	15.6	17.7	19.3	15.8	14.8	15.0	15.1	15.2	15.0	15.3	16.2
25	14.6	15.6	17.7	19.6	15.6	14.9	15.1	15.1	15.4	15.0	15.2	16.2
26	14.7	15.7	18.1	19.0	15.4	15.0	15.1	15.2	16.0	14.9	15.3	16.0
27	14.9	15.7	20.9	18.8	15.2	15.1	15.1	15.2	15.7	15.0	15.2	16.0
28	14.8	15.7	21.0	18.4	15.0	15.1	14.9	15.2	15.7	15.1	15.1	15.9
29	14.8	......	20.5	18.2	15.0	15.4	15.0	15.3	15.6	16.4	15.0	16.2
30	14.9	......	20.3	17.8	15.0	15.5	15.0	15.3	15.5	17.6	15.1	16.7
31	14.9	......	19.9	......	15.0	......	15.1	15.3	......	17.2	......	17.1

HUDSON RIVER BELOW DAM OF HUDSON RIVER POWER CO., TWO MILES BELOW MECHANICVILLE, N. Y.

This gage is located on the right-hand bank of Hudson river about one-quarter mile down-stream from the dam of the Hudson River Power Co. A vertical staff gage divided decimally from zero to 16 feet is placed within a square wooden well-curb on the stream bank. The interior of the well communicates *freely* with the water in the river by means of a buried pipe. The gage was established August 18, 1905, by this Department, and readings are taken at 8 A. M. and 5 P. M. each day by H. C. Tinker. The zero mark of the gage is at elevation 29.00.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River below Hudson River Power Co.'s Dam near Mechanicville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	34.1	31.0	30.7	37.2	35.0	31.3	31.2	30.3	29.7	31.7	33.5	31.0
2	33.6	30.8	30.8	36.2	35.2	31.4	31.2	30.8	29.8	31.8	32.8	31.4
3	33.2	30.8	30.0	35.4	34.9	31.6	31.4	30.6	29.8	31.8	33.6	31.2
4	34.4	30.6	30.8	34.6	34.7	31.6	30.8	30.4	30.0	31.5	34.4	31.2
5	34.4	31.2	30.4	34.3	35.2	31.4	31.8	30.2	32.0	31.8	34.2	31.0
6	33.9	31.0	30.6	34.2	34.9	31.4	31.6	30.2	32.0	31.2	33.8	31.0
7	33.8	31.0	30.4	33.8	34.6	31.6	30.6	30.2	31.6	31.6	36.0	31.0
8	34.0	30.9	30.8	33.6	34.6	31.6	31.5	30.1	31.0	31.6	36.7	30.6
9	34.0	30.9	30.6	33.2	34.1	31.4	30.9	30.2	31.4	32.8	36.2	30.7
10	33.4	31.0	30.0	33.0	34.1	31.6	30.4	30.2	31.0	33.2	35.6	31.8
11	33.4	31.1	30.6	33.0	33.4	31.2	30.4	29.7	31.2	33.0	35.0	34.2
12	32.7	30.9	30.5	32.9	33.1	31.2	30.8	29.6	31.8	33.2	34.5	34.6
13	32.3	30.9	30.6	32.0	33.1	31.2	30.8	29.8	31.2	32.5	33.8	33.8
14	31.3	31.1	30.9	31.1	32.7	30.9	30.4	30.0	31.6	31.4	33.4	33.1
15	32.0	31.0	32.4	31.2	32.6	30.9	30.6	29.8	31.3	32.0	33.0	33.0
16	31.6	30.9	31.7	32.7	32.4	30.8	30.4	30.0	31.4	31.8	32.6	32.9
17	31.6	31.0	32.2	32.6	33.1	31.2	30.5	29.6	31.3	31.4	32.2	32.6
18	31.8	31.2	32.6	32.4	33.1	31.2	30.4	29.8	31.2	31.4	32.3	32.0
19	31.6	30.9	32.0	32.3	32.6	31.1	30.4	30.0	30.8	31.4	32.1	32.3
20	32.0	30.6	31.6	32.1	32.5	30.4	30.6	29.8	30.4	31.0	31.8	32.1
21	32.3	30.7	31.6	31.4	32.2	30.7	30.6	29.8	30.5	31.4	31.6	32.0
22	31.6	30.9	31.6	31.6	32.0	31.0	30.6	29.8	30.2	31.4	31.6	31.5
23	31.4	31.0	32.0	31.7	31.8	30.7	30.6	29.6	30.8	31.0	31.6	31.9
24	31.2	30.4	32.3	32.4	31.7	30.8	30.4	29.8	31.2	31.1	31.0	34.2
25	31.4	30.6	33.6	33.8	31.8	30.8	31.4	29.8	31.0	31.1	31.8	34.2
26	31.2	30.8	33.4	34.0	31.3	30.8	30.6	29.8	30.7	31.4	31.3	34.0
27	30.9	30.8	33.4	35.4	31.6	31.0	30.8	30.0	30.4	30.9	31.4	33.7
28	31.0	30.6	34.3	35.1	31.8	30.6	30.6	29.8	30.8	32.4	31.5	33.7
29	31.4	......	35.8	35.2	32.0	30.7	30.4	29.8	31.0	35.4	31.4	33.6
30	31.0	......	36.8	35.2	31.8	31.0	30.4	29.8	31.8	35.2	31.3	33.5
31	31.0	......	37.2	......	31.8	......	30.3	29.8	......	33.9	......	34.0

HUDSON RIVER ABOVE DAM OF HUDSON RIVER POWER CO., TWO MILES BELOW MECHANICVILLE, N. Y.

This gage was established August 18, 1905, by this Department. The gage is a vertical staff divided to feet and tenths and reading from zero to 16 feet. It is attached to the up-stream face of the river wall at the right-hand end of the line of wastegates forming a continuation of the dam. Readings are taken at 8 A. M. and 5 P. M. by H. C. Tinker. The gage zero is at elevation 43.00. A record is kept in the adjoining power-plant, showing the use of water by the turbine wheels, and also the waste over the dam, through gates, etc.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Hudson River Power Co.'s Dam near Mechanicville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	49.8	49.3	49.2	52.8	50.9	49.0	48.8	48.4	49.1	49.5	49.5	49.6
2	49.9	49.2	49.2	52.2	51.0	49.2	49.2	49.3	49.2	49.3	49.2	49.4
3	49.5	49.3	49.0	51.5	50.8	49.0	49.0	49.2	48.8	49.2	50.2	49.6
4	50.3	49.4	49.2	50.8	50.6	49.0	48.9	49.2	49.4	49.5	50.4	49.2
5	50.4	49.4	49.0	50.3	51.5	48.6	49.2	48.8	49.4	49.4	50.2	49.1
6	50.2	49.2	49.2	50.3	50.7	48.9	49.2	49.1	49.4	49.6	50.0	49.2
7	50.0	49.3	49.0	50.2	50.6	49.0	49.1	49.2	49.0	49.4	51.6	49.3
8	50.1	49.4	49.0	49.8	50.6	49.2	49.2	49.2	49.0	49.5	52.0	49.4
9	49.8	49.4	49.1	49.5	50.2	49.4	48.8	49.2	49.0	49.8	51.8	49.2
10	49.8	49.4	49.2	49.8	50.0	49.1	49.1	49.3	49.4	50.0	51.8	49.4
11	49.4	49.4	49.2	49.4	49.6	48.8	48.9	49.2	49.2	49.7	51.4	50.5
12	49.2	49.4	49.2	49.6	49.8	48.6	49.0	49.0	49.2	50.0	50.5	50.3
13	49.4	49.2	49.1	49.7	49.5	48.2	49.0	49.2	49.3	49.6	50.2	50.0
14	49.3	49.2	49.6	49.8	49.4	48.0	48.8	49.4	49.4	49.5	49.8	49.4
15	49.1	49.2	49.4	49.6	49.4	48.1	49.2	49.0	49.0	49.2	49.4	49.4
16	48.8	49.2	49.2	49.3	49.2	48.4	49.2	47.9	49.1	49.4	49.4	49.4
17	48.6	49.2	49.2	49.4	49.7	48.8	49.4	48.8	48.6	49.0	49.6	49.4
18	48.3	49.2	49.2	49.4	49.5	49.0	49.4	49.2	48.8	48.8	49.4	49.4
19	48.6	49.2	49.2	49.2	49.5	49.0	49.2	49.0	48.8	48.4	49.1	49.2
20	49.2	49.2	49.0	49.4	49.3	48.7	49.2	49.2	43.2	49.2	49.0	49.4
21	49.0	49.3	49.1	49.4	49.2	49.0	49.6	49.3	49.0	48.7	48.8	49.2
22	48.6	49.2	49.4	49.4	49.3	48.8	48.7	49.2	49.0	48.4	48.4	49.6
23	48.4	49.3	49.4	49.1	49.2	49.2	49.0	49.2	49.0	48.1	48.4	49.2
24	48.4	48.9	50.8	49.6	49.2	49.1	49.0	48.8	49.2	48.2	48.5	50.3
25	48.2	49.4	49.8	50.0	49.2	49.0	49.2	49.0	48.8	47.9	48.8	50.6
26	48.5	49 0	49.7	50.2	49.4	48.8	49.0	49.2	49.2	49.4	49.2	49.9
27	48.8	49.2	49.7	51.4	49.0	49.1	49.2	49.2	49.0	49.2	48.8	49.6
28	49.4	49.1	50.2	51.5	49.2	48.9	49.2	48.8	49.2	49.8	49.1	50.0
29	49.4	......	50.6	51.0	49.4	49.0	49.1	49.0	49.4	51.0	49.1	50.0
30	49.2	......	52.2	50.9	49.5	49.2	49.0	48.8	49.2	50.8	49.2	50.5
31	49.1	......	53.0	......	49.2	......	49.3	49.2	......	49.8	......	50.2

HUDSON RIVER AT TOLL BRIDGE, MECHANICVILLE, N. Y.

A gage was established at River street bridge, Mechanicville, August 16, 1905, for this Department. A vertical gage, reading from zero to 15.5 feet, is attached to the down-stream end of the first pier from the right-hand bank. Readings are taken by W. E. Downing at 8 A. M. and 5 P. M. The gage zero is at elevation 48.77. During low water the water-surface falls below the zero mark of the gage at times. The readings of the low stages of the stream are approximate only.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Toll Bridge, Mechanicville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	53.3	49.8	49.1	54.5	52.7	50.4	49.7	49.0	48.9	50.3	51.1	50.1
2	51.7	49.6	49.2	53.8	52.8	49.8	49.9	49.2	49.4	50.1	50.8	50.0
3	51.4	49.7	49.4	53.0	52.5	50.5	49.5	49.8	49.1	50.4	51.4	50.1
4	52.1	49.7	49.6	52.3	52.5	50.4	49.5	49.7	49.6	50.4	52.1	49.9
5	52.3	49.8	49.1	52.0	52.7	50.1	49.8	49.0	51.0	50.4	51.9	49.9
6	51.7	49.8	49.3	51.8	52.3	50.0	50.1	49.3	50.6	50.3	52.0	50.0
7	51.7	49.8	49.2	51.7	52.3	50.0	49.9	49.4	50.1	50.2	53.9	49.8
8	51.9	49.8	49.2	51.3	52.2	50.3	49.9	49.1	50.0	50.2	54.0	49.7
9	51.7	49.8	49.2	51.0	52.2	50.4	49.5	49.2	50.1	50.9	53.7	50.0
10	51.5	49.7	49.2	51.1	51.8	49.9	49.5	49.6	49.8	51.7	53.2	50.5
11	51.6	49.7	49.2	50.9	51.4	49.7	49.2	49.0	50.2	51.0	52.7	52.6
12	50.6	49.8	49.3	50.9	51.1	49.3	49.4	49.1	50.7	51.3	52.1	52.4
13	50.3	49.8	49.3	51.0	51.0	49.2	49.7	49.6	50.0	50.7	51.8	51.7
14	50.3	49.3	49.9	50.8	50.7	49.1	49.1	49.4	50.3	50.6	51.2	51.1
15	50.2	49.1	51.0	50.9	50.7	49.3	49.7	48.7	50.0	50.6	51.0	51.1
16	50.3	49.2	50.7	50.8	50.9	49.0	49.8	48.5	50.0	50.3	50.7	50.9
17	50.3	49.2	50.7	50.7	51.1	49.9	49.8	48.7	49.8	50.2	50.9	51.0
18	50.2	49.2	50.7	50.5	51.0	49.6	49.8	49.3	49.9	50.0	50.9	50.8
19	50.5	49.4	50.6	50.3	50.9	49.5	49.8	49.1	49.5	49.7	50.4	50.8
20	51.4	49.5	49.9	50.5	50.7	49.0	49.8	49.6	49.9	49.7	50.5	50.7
21	50.5	49.3	50.1	50.0	50.5	49.7	50.0	49.6	49.5	49.7	50.3	50.6
22	50.2	49.2	50.2	50.1	50.5	50.0	49.8	49.4	49.0	49.7	50.1	50.9
23	49.9	49.3	50.4	50.0	50.4	49.3	49.7	49.6	50.0	49.5	49.9	50.3
24	49.7	49.0	51.8	50.3	50.1	49.5	49.5	49.0	50.3	49.5	49.9	52.1
25	49.5	49.2	51.4	51.7	50.3	49.6	50.2	49.1	49.9	49.4	49.9	51.9
26	49.2	49.0	51.2	51.8	49.7	49.4	49.9	49.7	49.7	49.8	50.0	51.7
27	49.2	49.0	51.2	53.0	50.1	49.7	49.8	49.6	49.8	49.7	49.7	51.4
28	49.2	49.0	52.1	53.0	50.6	49.3	49.7	49.1	49.8	50.6	49.9	51.7
29	49.3	......	53.4	52.8	50.7	49.4	49.6	49.1	49.8	53.0	50.0	51.7
30	49.6	......	54.1	52.7	50.8	49.3	49.7	49.1	50.3	52.8	50.0	51.7
31	49.9	......	54.8	.....	50.7	......	49.7	49.0	......	51.8	......	52.0

HUDSON RIVER AT WEST VIRGINIA PULP AND PAPER CO.'S MILL, MECHANICVILLE, N. Y.

A record of the flow of Hudson river at Mechanicville has been kept at the Duncan dam since December, 1888. The record includes two daily readings of the depth on the crest of the dam, and a continuous record of the run of the water-wheels in the adjoining paper-mill. The accompanying tables, computed by Mr. R. P. Bloss, the engineer of the West Virginia Pulp and Paper Company, show the daily and monthly mean flow at Mechanicville.

The dam at Mechanicville was raised during 1904, a concrete crest and apron being added, so that the dam has now a rounded, or ogee profile. A discharge curve has been calculated, using coefficients of discharge derived from United States Geological Survey experiments on models of dams of ogee cross-section.

Water carried in Champlain canal, which parallels Hudson river from Fort Edward to Albany, is not included in the estimated discharge.

Mean Daily Discharge, Second-feet, of Hudson River at West Virginia Pulp & Paper Co.'s Mill at Mechanicville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	17,960	5,662	3,101	36,672	20,529	7,388	5,216	2,159	3,256	8,072	14,958	5,093
2	15,790	5,440	3,193	31,028	24,326	6,995	5,269	3,100	3,427	7,955	12,403	6,878
3	14,200	4,399	3,200	25,262	21,989	7,869	4,904	3,100	3,280	8,182	13,788	6,300
4	18,330	4,752	3,229	20,501	19,412	7,940	4,935	2,159	3,524	7,746	18,846	5,807
5	18,979	5,129	2,396	19,021	23,231	6,549	5,251	1,991	8,246	8,834	18,063	5,242
6	16,568	4,720	3,092	17,400	21,816	7,177	6,666	2,686	10,255	6,971	16,615	5,039
7	16,429	4,347	3,273	16,666	20,931	7,770	5,583	2,865	8,246	8,194	27,934	4,628
8	16,731	4,484	3,005	16,168	20,410	8,410	5,445	2,654	5,920	8,363	31,848	3,494
9	17,220	4,871	2,936	14,234	18,076	6,593	4,060	2,295	6,996	10,739	29,851	5,011
10	14,022	4,427	2,900	13,659	17,277	7,770	3,326	2,654	5,880	13,889	25,859	8,248
11	13,890	4,456	2,933	12,568	15,111	6,304	3,124	1,875	6,073	13,017	23,938	22,770
12	11,564	4,661	3,147	12,691	13,955	5,739	3,618	1,617	9,383	14,395	19,346	20,394
13	9,836	3,230	3,009	12,761	13,206	5,263	4,983	2,654	6,854	10,296	17,295	16,634
14	9,832	4,435	4,343	12,832	11,145	4,913	2,795	2,008	9,050	11,506	15,421	14,259
15	9,005	4,415	9,263	13,252	12,236	4,948	3,812	1,936	5,583	9,508	13,207	11,025
16	8,884	4,193	8,852	12,001	10,611	5,100	3,062	1,652	7,935	8,363	11,375	13,087
17	5,221	3,954	9,123	11,477	14,118	5,575	2,952	1,738	7,111	7,548	9,031	11,785
18	5,811	4,017	9,293	10,651	13,933	4,935	3,740	1,306	5,663	6,809	10,254	10,846
19	6,240	4,219	9,247	9,945	11,499	4,831	3,543	2,088	5,884	6,476	8,790	10,229
20	8,383	3,513	7,917	9,565	10,952	3,587	3,257	*a*	4,960	5,329	8,024	8,805
21	7,687	3,422	8,189	8,225	10,061	3,315	4,695	*a*	4,962	7,024	7,518	8,824
22	6,120	3,839	8,548	8,659	9,715	4,951	3,896	*a*	3,468	6,272	7,816	6,973
23	5,842	3,022	9,615	7,959	8,733	4,271	3,213	*a*	5,722	5,993	7,682	11,149
24	6,000	4,458	15,071	10,472	8,254	4,643	2,990	*a*	5,663	5,719	6,202	20,331
25	6,483	3,238	14,037	16,501	8,659	3,925	6,661	*a*	6,516	5,408	8,118	18,291
26	5,604	2,515	14,528	17,833	7,371	4,051	4,064	*a*	5,719	5,297	7,800	19,844
27	4,491	3,726	14,481	25,928	7,614	4,717	3,586	2,448	5,791	5,190	7,716	18,401
28	4,912	2,351	18,740	24,305	8,769	3,686	3,705	3,487	5,065	9,483	7,320	19,180
29	6,407	.....	27,477	24,535	9,479	4,009	3,281	3,393	5,320	22,414	6,907	17,451
30	5,568	.....	32,306	23,749	8,769	3,713	3,251	3,228	8,796	23,578	6,808	16,221
31	5,036	.....	36,196	.....	8,755	.....	2,896	3,170	.....	17,913	.....	18,258
Mean	10,296	4,139	9,892	16,547	13,903	5,562	4,118	2,428	6,152	9,565	14,024	11,952

a No record.

Monthly Discharge of Hudson River at West Virginia Pulp and Paper Co.'s Mill, Mechanicville, N. Y.

[Drainage area, 4,500 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	18,979	4,494	10,296	2.29	2.63
February	5,662	2,354	4,139	0.92	0.96
March	36,196	2,396	9,892	2.20	2.53
April	36,672	7,959	16,547	3.67	4.11
May	24,326	7,371	13,903	3.09	3.55
June	8,410	3,315	5,562	1.23	1.38
July	6,666	2,795	4,118	0.91	1.05
August (24 days)	3,487	1,306	2,428	0.54	0.62
September	10,255	3,256	6,152	1.37	1.53
October	23,578	5,190	9,565	2.12	2.44
November	31,848	6,202	14,024	3.11	3.48
December	22,770	3,494	11,952	2.66	3.06

HUDSON RIVER AT B. & M. R. R. BRIDGE ABOVE MECHANICVILLE, N. Y.

This gage was established August 15, 1905, by this Department. The gage consists of a vertical board with painted tenth-foot marks reading from zero to 16 feet, and is attached to the down-stream end of the right-hand pier of the bridge. The gage datum is at elevation 66.50, and the gage is slightly inclined to conform with the batter of the pier. Readings are taken at 7 A. M. and 5 P. M. by W. B. Lebar. The gage is located about two-thirds mile up-stream from the Duncan dam.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Mechanicville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	71.5	69.5	68.2	72.7	71.2	69.0	69.0	68.7	68.3	69.2	70.0	69.0
2	70.6	69.3	68.1	72.0	71.3	69.4	69.1	68.8	68.3	69.2	70.0	68.0
3	70.4	69.2	68.7	71.4	71.2	69.3	68.9	68.8	68.0	69.0	71.4	68.8
4	70.8	69.2	68.2	71.0	71.0	69.0	69.0	68.4	67.9	69.0	70.8	68.6
5	70.8	69.2	67.8	70.6	71.4	68.8	69.2	68.4	69.4	69.1	70.4	68.4
6	70.8	69.5	67.8	70.5	71.1	68.8	69.6	68.5	69.8	69.4	70.4	68.6
7	70.4	69.4	67.6	70.7	70.9	69.0	69.0	68.4	69.2	69.2	71.8	68.3
8	70.6	69.5	67.6	70.4	70.8	69.2	68.6	68.5	69.0	68.6	72.2	68.8
9	70.5	69.4	67.8	70.1	70.6	69.4	68.1	68.4	68.9	69.4	72.0	68.3
10	70.2	69.6	68.6	70.0	70.6	69.2	68.0	68.5	68.6	70.0	71.7	69.2
11	70.0	69.2	68.2	69.9	70.3	68.8	68.0	68.3	68.7	69.9	71.3	70.8
12	70.0	69.2	67.6	69.8	70.3	68.5	67.9	68.2	69.0	69.8	70.3	71.1
13	69.8	69.0	67.3	69.9	70.2	68.2	68.3	68.4	69.0	70.0	69.9	70.4
14	69.7	69.0	68.2	70.2	70.0	68.4	68.4	68.4	69.2	69.6	69.5	70.1
15	69.6	69.0	69.8	70.0	70.2	68.2	67.7	68.4	69.2	69.3	69.3	69.6
16	69.0	68.9	69.4	69.8	69.8	69.0	67.6	68.4	68.7	69.0	69.1	69.4
17	68.9	69.0	69.9	69.8	70.0	68.8	66.6	68.4	68.6	68.6	69.8	69.1
18	68.9	68.9	69.8	69.6	70.0	68.4	67.6	68.2	68.4	68.4	69.6	68.8
19	68.8	69.1	69.4	69.5	70.0	68.0	67.6	68.3	68.4	68.2	69.0	68.5
20	69.7	69.0	68.8	69.4	69.9	67.2	68.0	68.2	68.3	68.8	68.8	69.2
21	69.6	68.9	68.6	69.7	69.6	67.8	69.2	66.6	68.2	68.8	68.9	69.4
22	69.2	68.8	69.0	69.5	69.3	68.4	68.6	66.6	68.4	68.6	69.0	69.6
23	69.3	68.4	69.1	69.0	69.2	68.9	68.6	66.0	68.2	68.4	69.0	70.0
24	69.5	68.6	70.6	69.6	69.2	68.6	68.4	65.7	68.5	68.5	69.4	70.8
25	69.9	68.4	70.3	70.4	69.0	68.0	69.2	65.6	68.4	68.2	69.1	71.0
26	69.9	68.2	70.2	70.5	69.1	67.1	69.2	67.4	68.6	68.4	69.0	70.8
27	69.9	68.1	70.2	71.5	69.2	68.3	69.3	68.3	68.4	68.8	68.9	70.6
28	69.7	67.8	70.8	71.6	69.2	68.0	69.0	68.2	68.3	68.7	68.8	70.5
29	69.6	......	71.6	71.4	69.4	68.0	68.6	68.0	68.8	69.2	68.9	70.5
30	69.8	......	72.5	71.2	69.2	68.8	68.9	68.0	69.2	70.2	68.8	70.3
31	70.0	....	73.0	......	69.1	......	68.8	68.0	......	70.5	......	70.4

HOOSIC RIVER.

DESCRIPTION.

Hoosic river has its sources on the west slope of the Hoosac mountains in Vermont and Massachusetts. Two head branches, one flowing southward, the other northward along the west slope of this range, unite at North Adams, Mass., and the stream then flows northwestward, entering the Hudson three miles north of Mechanicville. Above Buskirk the drainage basin is rugged and precipitous, the distribution of tributaries affording rapid concentration of the run-off from the steep rock slopes. The ridges are sparsely wooded. The soil in the valleys is generally firm and tenacious. The general elevation of the valley at the junction of the head waters is 1,000 feet. Numerous dams, affording power for textile, agricultural implement, and other industries, are scattered throughout the length of the stream from North Adams to Schaghticoke. The drainage basin contains no important lakes and but little storage in reservoirs.

HOOSIC RIVER AT SCHAGHTICOKE, N. Y.

This gage was established April 3, 1904, and is maintained by this Department in coöperation with the U. S. Weather Bureau. The gage is attached to the wall of the Empire Grist Mill at the right-hand end of the upper dam at Schaghticoke. It is in two sections, which are divided decimally from zero to 3 feet and 3 feet to 12 feet, respectively. Readings are taken by George W. Baldwin at 8 A. M. and 6 P. M. each day. Water is diverted to mills for power purposes at this dam and there is no direct relation between the discharge and the stage, as shown by the gage, except in times of extreme high water.

Mean Daily Gage Height, in Feet, of Hoosic River at Schaghticoke, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1.65	0.60	0.20	0.80	0.95	0.45	0.80	0.30	0.00	......	2.05	0.70
2	1.10	0.60	0.20	0.90	0.80	0.40	0.55	0.35	0.10	......	1.95	0.70
3	1.85	0.60	0.45	0.85	0.70	0.65	0.50	0.40	0.05	......	1.70	0.70
4	1.65	0.55	0.20	0.80	0.80	1.00	......	0.30	0.15	......	1.45	0.70
5	1.45	0.50	0.35	0.90	0.85	0.80	0.25	0.30	1.30	......	1.20	0.70
6	0.90	0.45	0.30	0.85	0.75	0.90	0.25	0.30	0.90	0.90	2.45	0.60
7	0.90	0.50	0.30	0.70	0.80	0.80	0.20	0.25	0.65	0.90	2.10	0.60
8	1.25	0.55	0.20	0.70	0.80	0.70	0.15	0.25	0.55	1.30	1.60	0.60
9	1.30	0.55	0.25	0.70	0.75	0.65	0.20	0.20	0.50	1.35	1.50	0.60
10	0.90	0.40	0.20	0.70	0.80	0.60	0.20	0.15	0.50	1.15	1.20	1.15
11	0.90	0.45	0.15	0.65	0.70	0.60	0.40	0.05	1.00	1.00	1.20	2.20
12	0.75	0.35	0.30	0.75	0.65	0.50	0.75	0.10	0.90	1.40	1.20	1.55
13	0.70	0.40	0.30	0.85	0.70	0.50	0.75	0.30	0.80	1.20	1.10	1.20
14	0.70	0.40	1.93	0.90	0.60	0.45	0.45	0.30	0.55	1.10	0.95	1.15
15	0.55	0.40	1.45	0.90	0.50	0.40	0.35	0.25	0.50	1.00	0.90	1.00
16	0.45	0.55	0.95	0.85	0.60	0.25	0.25	0.25	0.40	0.85	0.90	1.00
17	0.35	0.40	1.00	0.70	1.30	0.25	0.25	0.05	0.45	0.75	0.90	0.90
18	0.35	0.35	1.00	0.70	1.00	0.30	0.60	0.00	0.30	0.80	0.90	0.90
19	0.45	0.35	0.80	0.70	1.00	0.25	0.40	0.10	0.25	0.80	0.80	0.90
20	1.10	0.35	0.70	0.70	0.80	0.25	0.80	0.20	0.15	0.80	0.80	0.80
21	0.80	0.30	0.60	0.75	0.70	0.20	1.00	0.20	0.10	0.80	0.70	0.80
22	0.50	0.25	0.75	0.60	0.60	0.15	0.75	0.25	......	0.80	0.70	0.80
23	0.50	0.20	0.95	0.70	0.70	0.15	0.60	0.20	0.40	0.70	0.70	0.90
24	0.40	0.15	1.10	1.05	0.50	0.20	0.50	0.10	1.05	0.70	0.70	1.65
25	0.40	0.15	0.95	1.20	0.50	0.20	1.45	0.20	1.05	0.55	0.70	1.45
26	0.45	0.30	0.90	1.20	0.40	0.20	0.75	0.20	0.75	0.50	0.70	1.20
27	0.40	0.30	0.85	1.45	0.45	0.70	0.60	0.05	0.65	......	0.70	1.15
28	0.50	0.30	1.30	1.15	0.65	0.30	0.50	0.10	0.70	......	0.70	1.20
29	0.55	......	1.80	1.10	0.65	0.30	0.40	0.00	0.85	......	0.70	1.20
30	0.50	......	1.75	0.90	0.50	0.55	0.30	0.05	1.35	......	0.70	1.20
31	0.55	......	1.50	......	0.45	......	0.30	0.05	......	......	......	1.20

HOOSIC RIVER AT BUSKIRK, N. Y.

A gaging station was established September 25, 1903, at the highway bridge in Buskirk village by Robert E. Horton, for the U. S. Geological Survey, by which it has since been maintained in coöperation with this Department. The channel is straight near the gaging station. The banks are high and seldom overflow. The current is exceptionally smooth, but is rather slow during low water. A standard chain gage is attached to the covered wooden highway bridge. The length of the chain is 28.17 feet. The gage is read twice each day by Bert C. Henry. A bench-mark is located on the up-stream corner of the left abutment; elevation, 36.03 feet above gage datum.

Mean Daily Gage Height, in Feet, of Hoosic River at Buskirk, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	5.55	.....	.....	4.25	3.70	2.35	3.25	2.00	1.40	3.10	4.25	2.30
2	4.70	.....	.....	3.60	3.50	2.35	2.65	2.20	1.50	2.70	4.15	2.35
3	3.90	.....	.....	3.30	3.10	3.20	2.45	3.20	1.65	2.50	6.55	2.35
4	5.65	.....	.....	3.15	3.15	3.75	2.20	2.00	1.90	3.45	4.90	2.40
5	4.95	.....	.....	3.50	3.35	3.10	2.20	1.95	3.50	3.65	4.05	2.10
6	3.70	.....	.....	3.60	3.15	3.50	2.00	1.80	2.65	3.15	3.85	2.35
7	3.65	.....	.....	3.05	3.10	3.35	2.65	1.90	2.00	2.90	8.90	2.45
8	4.05	.....	.....	3.00	3.45	3.25	2.10	1.75	1.75	3.90	5.90	2.25
9	4.60	.....	.....	2.85	3.25	3.00	1.90	1.75	1.90	4.15	4.80	2.25
10	3.50	.....	.....	2.90	3.05	2.60	1.90	1.70	1.90	3.30	4.30	4.90
11	3.50	.....	.....	2.75	2.95	2.70	1.90	1.60	1.90	3.00	4.20	7.10
12	3.25	.....	.....	2.95	3.10	2.60	3.10	1.60	2.50	4.40	3.75	4.60
13	2.80	.....	.....	2.70	2.75	2.55	3.40	1.70	2.00	3.65	3.45	3.65
14	2.90	.....	.....	3.15	2.55	2.40	3.20	1.50	1.85	3.30	3.35	3.50
15	2.60	.....	4.65	3.25	2.40	2.30	2.55	1.70	1.70	3.00	3.30	3.15
16	2.50	.....	3.70	3.15	2.60	2.25	2.20	1.40	1.75	2.85	3.10	3.30
17	3.45	.....	3.45	3.10	4.70	2.25	2.15	1.50	1.75	2.75	2.90	3.15
18	4.50	.....	3.55	3.15	3.60	2.20	2.40	1.50	1.70	2.60	2.90	3.25
19	4.55	.....	3.30	2.75	3.25	2.15	2.30	1.60	1.80	2.45	2.90	2.95
20	.....	.....	2.90	2.75	3.20	2.30	2.20	1.60	1.80	2.30	2.75	2.85
21	.....	.....	2.75	2.55	2.95	2.20	4.45	1.55	1.80	2.70	2.70	2.75
22	.....	.....	2.85	2.80	2.65	2.20	3.00	1.60	1.65	2.50	2.70	2.70
23	.....	.....	3.60	2.90	2.65	1.95	2.70	1.45	2.10	2.35	2.75	3.10
24	.....	.....	4.10	4.20	2.55	2.05	2.50	1.60	3.65	2.30	2.50	6.10
25	.....	.....	3.50	4.05	2.45	1.80	5.50	1.35	3.05	2.20	2.60	4.35
26	.....	.....	3.40	3.85	2.35	2.10	3.45	1.50	2.40	2.15	2.50	3.85
27	.....	.....	3.50	5.20	2.65	2.50	2.55	1.55	2.20	2.20	2.50	3.50
28	.....	.....	5.05	4.20	2.55	2.15	2.25	1.55	2.20	6.00	2.45	3.60
29	.....	.....	6.10	3.55	2.50	2.10	2.20	1.55	2.80	8.80	2.60	3.80
30	.....	.....	6.40	3.85	2.30	2.60	2.05	1.50	3.70	7.55	2.45	3.60
31	.....	.....	5.15	.....	2.35	.....	2.10	1.60	.....	5.05	.....	4.00

Current-meter Discharge Measurements of Hoosic River at Buskirk, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1907.		*Feet.*	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
June 24	Wood and Hoyt	1.90	124	393	0.98	386
Sept. 7	W. G. Hoyt	2.10	124	411	1.04	429
Dec. 24	D. M. Wood	6.43	142	1,020	4.77	4,870

Rating table for Hoosic River at Buskirk, N. Y., from September 25, 1903, to December 31, 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1.20	74	2.40	642	3.60	1,614	4.80	2,985
1.30	106	2.50	704	3.70	1,716	4.90	3,110
1.40	140	2.60	769	3.80	1,822	5.00	3,240
1.50	176	2.70	837	3.90	1,930	5.50	3,905
1.60	216	2.80	909	4.00	2,040	6.00	4,600
1.70	260	2.90	985	4.10	2,150	7.00	6,080
1.80	308	3.00	1,065	4.20	2,265	8.00	7,630
1.90	359	3.10	1,149	4.30	2,380	9.00	9,230
2.00	412	3.20	1,236	4.40	2,495	10.00	10,880
2.10	467	3.30	1,326	4.50	2,615		
2.20	524	3.40	1,419	4.60	2,735		
2.30	582	3.50	1,515	4.70	2,860		

The above table is applicable only for open-channel conditions. It is based on 11 discharge measurements made during 1903–1906. It is fairly well defined between gage heights 1.6 feet and 7 feet.

Mean Daily Discharge, Second-feet, of Hoosic River at Buskirk, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	3,970	*a*	*a*	2,320	1,720	612	1,280	412	140	1,150	2,320	582
2	2,860	*a*	*a*	1,610	1,520	612	803	524	176	837	2,210	612
3	1,930	*a*	*a*	1,330	1,150	1,240	673	1,240	238	704	5,400	612
4	4,110	*a*	*a*	1,190	1,190	1,770	524	412	359	1,470	3,110	642
5	3,180	*a*	*a*	1,520	1,370	1,150	524	386	1,520	1,660	2,100	467
6	1,720	*a*	*a*	1,610	1,190	1,520	412	308	803	1,190	1,880	612
7	1,660	*a*	*a*	1,110	1,150	1,370	803	359	412	985	9,070	673
8	2,100	*a*	*a*	1,060	1,470	1,280	467	284	284	1,930	4,460	553
9	2,740	*a*	*a*	947	1,280	1,060	359	284	359	2,210	2,980	553
10	1,520	*a*	*a*	985	1,110	769	359	260	359	1,330	2,380	3,110
11	1,520	*a*	*a*	873	1,020	837	359	216	359	1,060	2,260	6,240
12	1,280	*a*	*a*	1,020	1,150	769	1,150	216	704	2,500	1,770	2,740
13	909	*a*	*a*	837	873	736	1,420	260	412	1,660	1,470	1,660
14	985	*a*	*a*	1,190	736	642	1,240	176	334	1,330	1,370	1,520
15	769	*a*	2,800	1,280	642	582	736	260	260	1,060	1,330	1,190
16	*a*	*a*	1,720	1,190	769	553	524	140	284	947	1,150	1,330
17	*a*	*a*	1,470	1,150	2,860	553	496	176	284	873	985	1,190
18	*a*	*a*	1,560	1,190	1,610	524	642	176	260	769	985	1,280
19	*a*	*a*	1,330	873	1,280	496	582	216	308	673	985	1,020
20	*a*	*a*	985	873	1,240	582	524	216	308	582	873	947
21	*a*	*a*	873	736	1,020	524	2,560	196	308	837	837	873
22	*a*	*a*	917	909	803	524	1,060	216	238	704	837	837
23	*a*	*a*	1,610	985	803	386	837	158	467	612	873	1,150
24	*a*	*a*	2,150	2,260	736	440	704	216	1,660	582	704	4,740
25	*a*	*a*	1,520	2,100	673	308	3,900	123	1,110	524	769	2,440
26	*a*	*a*	1,420	1,880	612	467	1,470	176	642	496	704	1,880
27	*a*	*a*	1,520	3,500	803	704	736	196	524	524	704	1,520
28	*a*	*a*	3,300	2,260	736	496	553	196	524	4,600	673	1,610
29	*a*	......	4,740	1,560	704	467	524	196	909	8,910	769	1,820
30	*a*	......	5,180	1,880	582	769	440	176	1,720	6,930	673	1,610
31	*a*	......	3,440	......	612	......	467	216	......	3,300	......	2,040
Mean	2,080	......	2,150	1,410	1,080	758	871	277	542	1,710	1,890	1,550

a Ice obstruction.

Monthly Discharge of Hoosic River at Buskirk, N. Y.

[Drainage area, 579 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January (15 days)	4,110	769	2,080	3.60	4.14
February	....	....	....	....	....
March (17 days)	5,180	873	2,150	3.72	4.28
April	3,500	736	1,410	2.44	2.73
May	2,860	582	1,080	1.87	2.15
June	1,770	308	758	1.31	1.47
July	3,900	359	871	1.51	1.74
August	1,240	123	277	0.479	0.551
September	1,720	140	542	0.938	1.05
October	8,910	496	1,710	2.96	3.40
November	9,070	673	1,890	3.27	3.66
December	6,240	467	1,550	2.68	3.08

HOOSIC RIVER AT HOOSICK FALLS, N. Y.

This gage was established April 3, 1904, and is maintained by this Department in coöperation with the U. S. Weather Bureau. The gage, which is vertical, has painted tenth-foot marks and reads from 7 to 15 feet, and is attached to the partition wall of the head gate chamber of the factory of Walter A. Wood & Co. at the left-hand end of the dam, and a short distance up-stream from the crest line. Readings are taken by Sanford L. Cluett at 7 A. M. and 5 P. M. each day. The 7-foot mark of the gage is at elevation 410.04, B. & M. R. R. datum. It is referred to a copper plug at elevation 419.61, B. & M. R. R. datum, in the wall coping at the up-stream side of the head gate chamber. In low stages of the stream a large portion of the flow above this dam is diverted to the power-plant and there is no direct relation between the discharge and gage reading at such times.

Mean Daily Gage Height, in Feet, of Hoosic River at Hoosick Falls, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1.95	0.25	—0.10	1.10	0.75	0.35	0.70	0.10	0.15	0.65	1.15	0.50
2	0.85	0.25	—0.15	0.85	0.75	0.45	0.40	0.20	0.10	0.50	1.05	0.40
3	0.75	0.25	0.55	0.70	0.60	0.80	0.30	0.30	—0.65	0.45	1.95	0.30
4	1.65	0.20	0.35	0.65	0.55	1.10	0.30	0.25	0.15	0.75	1.40	0.25
5	1.50	0.15	0.15	0.75	0.75	0.80	0.25	0.10	0.35	0.90	1.15	0.20
6	1.05	0.15	0.15	0.85	0.65	1.80	0.15	0.10	0.50	0.65	0.95	0.20
7	0.85	0.15	—0.15	0.75	0.65	0.90	0.20	0.15	0.25	0.60	2.65	0.30
8	1.30	0.15	—0.10	0.65	0.75	0.85	0.20	0.00	0.15	0.85	1.75	0.40
9	1.35	0.15	—0.15	0.55	0.75	0.75	0.10	0.10	0.20	1.05	1.40	0.40
10	1.10	0.20	—0.10	0.55	0.65	0.65	0.00	0.15	0.25	0.75	1.30	0.95
11	0.70	0.15	0.20	0.50	0.65	0.55	—0.10	0.15	0.20	0.60	1.15	2.10
12	0.70	0.20	0.15	0.55	0.55	0.45	0.55	—0.05	0.50	1.15	0.85	1.40
13	0.70	0.25	0.35	0.75	0.55	0.45	0.70	—1.05	0.35	1.05	0.85	1.10
14	0.55	0.20	1.40	0.85	0.45	0.35	0.55	—1.05	0.15	0.75	0.80	0.85
15	0.45	0.15	1.40	0.80	0.30	0.35	0.30	0.05	0.25	0.65	0.65	0.90
16	0.35	0.15	1.40	0.70	0.40	0.30	0.15	—0.75	—0.15	0.60	0.65	0.80
17	0.25	0.10	1.05	0.75	1.30	0.25	0.10	—0.40	—1.85	0.50	0.70	0.75
18	0.25	0.15	1.10	0.65	0.95	0.25	0.45	0.10	—1.40	0.45	0.65	0.80
19	0.45	0.10	0.75	0.55	0.85	0.20	0.35	—0.75	—0.60	0.45	0.60	0.70
20	1.65	0.25	0.60	0.55	0.75	0.25	0.25	—0.55	—0.40	0.50	0.55	0.60
21	1.05	0.15	0.45	0.55	0.65	0.25	1.15	—0.45	—1.40	0.55	0.45	0.60
22	0.40	0.15	0.55	0.55	0.50	0.20	0.75	—0.50	0.15	0.50	0.40	0.60
23	0.35	0.20	1.00	0.50	0.45	0.15	0.60	—0.65	—0.15	0.40	0.40	0.85
24	0.30	0.15	1.45	1.15	0.45	0.15	0.45	0.05	1.10	0.40	0.40	1.70
25	0.15	0.20	1.90	1.15	0.35	0.15	0.65	0.15	0.65	0.20	0.45	1.40
26	0.25	0.30	0.85	0.95	0.45	0.35	0.50	—1.05	0.45	0.25	0.35	1.00
27	0.25	0.35	0.90	1.45	0.55	0.35	0.45	—0.85	0.35	0.30	0.35	0.90
28	0.25	0.30	1.55	1.15	0.65	0.25	0.40	—1.15	0.05	1.70	0.45	1.00
29	0.25	......	1.85	0.95	0.55	0.15	0.20	—0.85	0.60	3.10	0.50	1.00
30	0.25	......	1.85	0.75	0.45	0.20	0.15	—1.30	1.15	2.50	0.40	1.05
31	0.25	......	1.55	......	0.45	......	0.10	—1.00	......	1.55	......	1.05

HUDSON RIVER AT STILLWATER, N. Y.

A gage was established at the highway bridge crossing the Hudson river at Stillwater and a record was begun December 28, 1907. Readings are taken each morning. The gage is located a short distance above the dam and is also about one mile above the junction of Hoosic river with Hudson river.

HUDSON RIVER AT SCHUYLERVILLE, N. Y.

This gage, which was established August 14, 1905, is located on the down-stream end of the fourth pier from the right-hand bank of Ferry street bridge at Schuylerville. The gage, which has painted tenth-foot marks, reads from zero to 16 feet. The zero mark is at elevation 81.50. Readings are taken at 8 A. M. and 5 P. M. by Walter Curtis. The river is divided by an island at the point where the bridge crosses. The gage is located on the right-hand channel near the island.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Schuylerville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	88.5	85.6	84.0	93.6	90.2	85.8	84.8	84.2	84.0	85.6	87.4	85.1
2	88.6	85.2	84.1	92.2	90.5	86.0	85.2	84.4	83.7	86.0	86.8	85.4
3	88.2	84.8	84.4	90.7	90.2	85.6	85.0	84.3	83.6	85.9	87.2	85.4
4	88.8	85.2	84.4	89.6	89.9	85.3	85.0	84.2	84.1	85.5	88.6	85.4
5	89.2	85.4	84.4	89.2	90.2	85.1	85.4	84.2	85.6	85.5	88.5	85.2
6	88.8	85.0	84.5	88.9	89.9	85.4	86.0	84.5	86.3	85.4	88.4	85.1
7	88.5	85.2	84.6	88.4	89.7	85.6	85.0	84.6	85.7	85.8	90.1	84.8
8	88.4	85.1	84.6	88.2	89.3	85.8	85.0	84.4	85.0	85.8	91.8	84.6
9	88.2	84.8	84.5	87.8	88.8	85.5	84.8	84.3	85.4	86.8	91.7	85.0
10	87.9	84.7	84.2	87.6	88.4	85.6	84.6	84.5	85.1	87.4	90.8	85.8
11	87.6	85.2	84.3	87.3	88.1	85.4	84.6	84.3	85.0	87.4	90.0	87.2
12	87.0	85.4	84.4	87.2	87.6	85.3	84.6	84.4	85.6	87.4	89.0	89.0
13	86.6	85.0	84.6	87.2	87.6	85.2	84.6	84.5	85.4	86.8	88.3	87.8
14	86.5	85.1	85.2	87.2	87.2	85.2	84.3	84.2	86.0	86.6	87.8	87.2
15	86.1	85.0	85.9	87.3	87.0	85.0	84.2	84.1	85.4	86.1	87.2	86.8
16	86.6	85.0	85.8	87.0	86.8	84.7	84.2	84.2	85.6	85.9	86.8	87.5
17	87.4	84.6	86.3	86.7	87.1	85.1	84.3	84.2	85.4	85.6	86.2	87.1
18	87.4	84.8	86.6	86.6	87.2	85.0	84.4	84.0	84.9	85.4	86.4	86.6
19	87.2	84.8	86.8	86.4	86.8	85.0	84.4	83.8	84.7	85.3	86.1	86.5
20	86.6	84.6	86.4	86.4	86.6	84.6	84.3	83.9	84.5	85.2	85.8	86.4
21	86.8	84.8	86.3	85.9	86.3	84.4	84.0	83.8	84.5	85.6	85.7	86.4
22	86.5	84.6	86.3	86.0	86.1	85.0	84.4	83.7	84.2	85.3	85.6	86.2
23	86.5	84.5	86.4	86.0	86.1	84.6	84.2	83.7	84.6	85.4	85.5	88.8
24	86.2	84.3	87.6	86.6	85.8	84.6	84.1	83.8	84.6	84.8	85.4	88.4
25	86.0	84.5	87.4	88.0	85.8	84.8	84.0	83.7	84.6	84.9	85.6	88.4
26	86.0	84.6	87.5	88.5	85.4	84.5	84.2	84.0	84.6	84.8	85.3	88.4
27	85.9	84.4	87.6	90.5	85.6	84.6	84.8	84.0	84.9	84.4	85.4	87.8
28	85.5	84.4	88.7	90.4	85.9	84.6	84.9	84.1	84.9	85.6	85.5	88.0
29	85.8	.....	90.8	90.4	86.3	84.9	85.1	83.8	85.0	88.6	85.4	87.8
30	85.6	.....	92.2	90.3	86.2	84.7	84.4	84.0	85.2	88.4	85.3	88.1
31	85.5	....	93.8	.....	86.0	......	84.0	84.0	......	88.0	......	88.6

HUDSON RIVER AT FREE BRIDGE, NEAR LIBERTY MILLS.

A meter gaging station was established at the highway bridge over the Hudson river near Liberty Mills, October 23, 1905, by C. A. Poole.

This bridge, which is commonly known as "Free Bridge," is about three-quarters of a mile south of the State dam at Northumberland and about one-quarter of a mile north of the mouth of the Batten kill. The entire yield of the watershed passes the station, except that diverted at the dam at Northumberland for the supply of the Champlain canal, and that passing northerly from Glens Falls feeder.

The gage is of the weight-and-chain type, and is attached to the lower chord of the north truss of the east span at first panel point from pier.

The datum to which all gage readings are added is 83.12, which is the elevation of bottom of weight when the end of chain is opposite the zero of the gage. Observations of the stage of the stream are taken twice each day by Wm. Dunstan.

Current-meter measurements were made by C. A. Poole in 1905 and 1906 from the bridge, which consists of three spans, with a total length of 426.2 feet between abutments.

The river channel is partly of rock and partly of gravel and of uniform cross-section under the bridge. About 400 feet below the bridge are rapids. The channel is straight for several hundred feet below the bridge to a point where the stream is divided by an island. Above the bridge the river bends slightly to the south. The current is somewhat sluggish during low water.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River near Liberty Mills.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	89.5	86.4	85.4	95.0	91.4	86.2	85.1	84.3	84.1	86.6	88.4	85.0
2	89.3	86.2	85.4	93.5	91.7	86.3	85.6	84.9	83.7	87.0	87.9	86.2
3	89.2	85.8	85.4	92.2	91.2	86.3	85.4	84.8	84.2	86.8	88.2	86.1
4	89.7	86.3	85.2	90.9	91.4	85.9	85.5	84.6	84.9	86.3	89.8	86.7
5	90.0	85.9	85.3	90.3	91.4	85.6	86.0	84.4	86.3	86.2	89.8	85.8
6	89.9	86.2	85.2	90.0	91.2	85.8	87.0	84.9	87.2	85.9	89.3	85.6
7	89.4	86.1	85.3	89.6	90.9	86.4	85.3	84.8	86.5	86.4	91.5	85.3
8	89.4	86.1	85.3	89.3	90.3	86.5	85.5	84.7	85.6	86.3	93.3	85.2
9	89.1	86.1	85.3	88.7	90.0	86.3	85.5	84.8	86.0	87.8	93.1	85.5
10	88.8	85.8	85.1	88.6	89.7	86.3	85.2	84.8	85.6	88.6	92.0	86.8
11	88.5	85.9	84.9	88.1	88.9	85.9	85.1	84.2	85.6	88.5	91.2	89.9
12	87.9	86.4	85.2	88.0	88.5	85.6	84.8	84.0	86.2	88.8	90.2	90.4
13	87.7	85.9	85.2	88.1	88.4	85.7	84.6	84.7	86.1	88.3	89.5	89.5
14	87.2	85.5	85.6	88.0	87.9	85.5	84.4	84.2	86.7	87.6	88.8	88.8
15	86.9	85.9	86.8	88.0	87.9	85.5	84.7	84.0	86.3	87.1	88.2	88.4
16	86.9	86.0	86.6	87.8	87.5	85.7	84.7	83.7	86.2	86.7	87.7	88.2
17	87.7	85.2	86.8	87.6	87.9	85.8	84.6	84.3	85.7	86.5	86.8	88.3
18	87.2	85.7	87.7	87.4	88.4	85.4	84.8	84.2	85.6	86.1	87.1	87.7
19	87.1	85.7	87.3	87.2	88.0	85.3	84.8	84.5	85.1	85.9	86.8	87.5
20	86.8	85.8	87.1	87.1	87.3	84.9	84.8	83.7	84.9	85.7	86.5	87.1
21	87.1	85.7	86.9	86.9	87.1	84.7	84.9	84.4	84.9	86.1	86.4	87.1
22	86.8	85.5	86.8	86.8	86.9	85.4	84.3	84.0	84.6	85.7	86.4	86.2
23	86.6	85.5	87.1	86.6	86.8	84.7	84.3	84.4	84.6	85.7	86.4	86.9
24	86.8	85.3	88.4	87.5	86.4	85.2	84.3	84.2	85.0	85.7	86.0	89.1
25	86.5	85.0	88.4	89.3	86.8	85.0	84.4	84.2	85.2	85.5	86.6	89.7
26	86.9	85.5	88.5	89.8	86.2	85.0	84.7	84.6	85.2	85.4	86.4	89.4
27	86.8	85.5	88.8	91.7	86.2	85.2	84.8	84.4	85.5	84.9	86.2	89.1
28	86.8	85.4	89.9	91.6	86.7	84.9	84.6	84.3	85.5	86.9	86.2	89.4
29	87.0	......	91.8	91.7	87.1	85.0	85.0	84.0	85.5	90.0	86.1	89.0
30	86.5	......	93.7	91.6	87.2	84.8	84.7	84.2	85.8	89.7	86.0	89.2
31	86.5	......	95.3	......	86.8	......	84.5	84.5	......	89.1	......	89.7

HUDSON RIVER ABOVE DAM AT NORTHUMBERLAND, N. Y.

Champlain canal crosses the Hudson river in the pool formed by the State dam at Northumberland. The gage, which was established April 11, 1904, is located on the right-hand bank of the stream above Northumberland dam and about 200 feet downstream from the towing bridge. The gage is a vertical scale with painted tenth-foot marks and is attached to the docking forming the towpath wall. Readings are taken at 8 A. M. and 5 P. M. by G. Hammond. The zero mark of the gage is at elevation 100.58.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Dam at Northumberland, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	103.9	102.9	102.[illegible]	107.2	105.8	102.6	102.5	102.3	102.6	104.2	105.5	104.6
2	104.[illegible]	102.7	102.1	106.9	105.9	102.7	102.5	102.6	101.9	104.9	105.4	104.3
3	104.[illegible]	103.1	103.1	105.5	105.6	102.6	102.9	102.4	101.9	105.1	105.5	104.2
4	104.4	102.9	102.1	105.4	105.6	102.2	103.2	102.8	102.0	105.3	105.6	104.1
5	104.6	102.8	101.8	105.0	106.1	103.2	103.4	102.5	103.4	105.4	105.9	103.7
6	104.9	102.5	102.2	105.1	105.9	103.2	103.7	102.4	103.8	105.5	106.1	104.1
7	104.6	102.8	102.2	104.6	105.6	102.8	103.4	102.4	104.1	105.2	106.1	103.6
8	104.7	102.9	102.1	104.4	105.1	102.8	103.2	102.3	103.9	104.5	106.9	104.6
9	104.5	102.8	101.7	104.2	104.8	102.8	102.9	102.3	103.8	105.2	107.4	104.9
10	104.4	103.0	103.1	104.1	104.6	102.7	102.8	102.2	104.0	105.6	107.3	104.7
11	104.1	103.0	101.1	104.1	105.1	102.6	102.7	102.6	103.2	105.6	107.1	105.8
12	104.1	103.0	102.0	104.1	104.4	102.5	102.4	102.2	104.2	105.5	106.7	106.0
13	103.9	103.1	102.2	104.2	104.1	102.9	102.2	102.2	104.8	105.5	106.2	105.6
14	103.6	103.0	102.4	104.1	103.9	102.9	102.8	102.0	104.4	105.1	106.2	105.5
15	103.5	102.5	102.8	104.0	103.6	102.4	102.2	102.2	104.2	104.7	106.1	106.0
16	103.4	102.5	103.2	103.9	103.8	102.6	102.2	102.1	104.3	104.5	105.7	106.0
17	103.3	103.2	103.7	103.7	103.9	102.6	102.4	102.0	102.7	104.4	105.2	105.2
18	103.2	102.5	103.4	103.6	104.1	103.0	102.2	102.3	102.0	104.3	105.0	104.9
19	103.0	102.5	103.2	103.6	103.8	103.2	102.3	102.0	102.2	104.4	104.9	104.8
20	103.2	102.4	103.1	103.6	102.7	103.3	102.2	102.0	103.6	104.6	104.6	105.1
21	103.3	102.5	103.2	103.6	103.5	103.4	102.8	102.2	102.2	104.4	104.4	104.6
22	103.0	102.6	103.1	103.4	103.5	103.5	102.3	102.0	102.1	104.2	104.2	104.9
23	103.1	102.6	103.5	103.9	103.6	103.2	102.3	101.9	102.3	104.1	104.2	104.8
24	103.1	103.1	104.7	104.7	103.6	103.2	102.3	102.0	102.8	104.5	104.4	105.2
25	103.0	101.3	104.3	105.0	103.7	102.9	102.2	103.0	103.4	105.2	104.7	105.7
26	102.8	102.2	104.2	105.8	103.4	102.8	102.2	102.3	103.5	106.0	104.5	105.7
27	102.6	102.4	104.5	106.1	103.4	103.0	102.4	102.1	104.6	105.9	104.4	105.6
28	103.2	102.2	104.9	106.1	103.5	103.3	103.0	102.2	104.0	105.7	104.3	105.6
29	102.9	......	105.2	106.1	103.4	103.3	102.4	102.1	......	105.7	104.2	105.7
30	102.9	......	106.6	105.9	103.5	103.3	102.4	102.1	......	105.9	104.1	105.7
31	103.0	...	107.8	......	103.5	......	102.4	102.1	......	105.8	.....	105.8

HUDSON RIVER AT HILL STREET BELOW FORT MILLER, N. Y.

A line of timber cribs crosses the Hudson river diagonally about one mile below Fort Miller dam. A gage was established at this point April 11, 1904, by J. A. O'Connor, for this Department. The gage is in two sections. The lower section is attached to the down-stream face of the second crib, located about 55 feet from the left-hand bank. The upper section is attached to the down-stream face of the crib nearest the left-hand bank. The gage zero is at elevation 100.50. Readings of this gage and of the gages below and above Fort Miller dam are taken each morning and afternoon by L. C. Brazier.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Hill St., below Fort Miller, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	105.0	103.6	103.1	109.6	107.2	104.0	103.4	103.1	103.4	105.4	106.4	105.4
2	105.5	103.5	103.2	108.6	107.6	104.8	103.6	103.2	103.0	105.9	106.0	105.2
3	105.4	103.4	103.8	107.6	107.2	104.2	103.8	103.2	102.8	105.7	106.8	104.9
4	105.8	103.7	102.6	106.8	107.3	104.0	104.3	103.7	103.1	105.4	107.4	104.9
5	106.0	103.6	102.8	106.5	107.4	103.8	104.2	103.0	104.1	105.3	107.3	105.0
6	106.2	103.6	103.0	106.4	107.2	103.8	104.8	103.2	105.4	106.0	107.2	104.3
7	106.1	103.8	103.0	106.4	107.0	104.4	104.4	103.2	104.8	105.6	108.3	104.2
8	106.1	103.7	103.0	106.0	106.6	104.4	103.8	103.0	105.0	105.6	109.0	105.4
9	105.9	103.8	103.0	105.6	106.4	104.4	103.4	103.2	105.0	106.4	108.9	105.0
10	105.8	104.2	104.2	105.4	106.3	104.2	103.4	103.0	104.5	106.8	108.6	105.5
11	105.4	104.0	102.6	105.3	105.7	104.0	103.3	103.6	104.8	106.7	107.9	107.0
12	105.3	103.6	103.0	105.2	105.8	103.8	103.0	103.1	105.3	106.6	107.4	107.3
13	105.0	103.8	102.9	105.2	105.4	103.8	103.0	103.0	104.6	106.6	106.9	106.8
14	104.8	103.6	103.2	105.4	105.3	103.8	103.6	102.8	105.7	106.2	106.4	106.6
15	104.5	103.4	103.7	105.2	105.3	103.8	103.3	102.7	106.0	105.8	106.3	106.9
16	104.4	103.2	103.5	105.0	104.9	103.6	102.8	103.0	105.6	105.8	106.0	106.6
17	104.4	104.1	104.7	105.0	105.1	104.0	103.2	103.0	104.6	105.6	106.1	106.4
18	103.9	103.2	104.5	105.0	105.5	103.6	103.3	103.6	104.8	105.4	105.6	106.3
19	103.8	103.4	104.4	104.8	105.2	103.6	103.0	103.2	103.4	105.2	105.4	106.2
20	104.2	103.2	104.3	104.6	104.8	103.4	103.0	102.9	103.2	105.5	105.2	106.3
21	104.4	103.2	104.2	104.7	103.4	103.2	103.7	103.2	103.2	105.5	105.2	105.6
22	103.8	103.3	104.2	104.5	104.4	103.8	103.0	103.0	104.6	105.0	105.3	105.8
23	104.0	103.0	104.6	104.4	104.2	104.0	103.2	102.9	103.2	104.8	105.3	105.8
24	104.0	104.2	106.1	104.9	104.2	103.5	103.2	102.9	103.0	105.0	105.4	106.6
25	103.9	102.6	105.6	106.0	104.4	103.4	103.2	103.6	102.9	104.6	105.4	107.1
26	103.8	103.4	105.6	106.4	104.2	103.4	103.3	103.3	103.2	104.6	105.4	106.8
27	104.0	103.6	105.6	107.4	104.0	103.4	103.2	103.0	104.0	105.4	105.2	106.6
28	103.8	103.5	106.4	107.6	104.4	103.2	104.0	102.7	104.5	106.0	105.2	106.6
29	103.8	......	107.8	107.4	104.4	103.4	103.4	103.1	105.6	107.4	105.2	106.8
30	103.6	......	108.8	107.5	104.4	104.0	103.2	103.1	105.1	107.0	105.0	106.8
31	104.0	......	110.0	......	104.5	......	103.0	103.0	......	106.8	......	107.1

HUDSON RIVER BELOW DAM AT FORT MILLER, N. Y.

This gage, which was established April 11, 1904, is attached to the face of the bulkhead wall below the Fort Miller Paper Co.'s mill. The gage is near the down-stream end of the wall and is divided decimally from zero to 8 feet. The zero mark is at elevation 104.08.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River below Dam at Fort Miller, N. Y.

DAY.	Jan.	Feb.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	105.6	105.0	105.1	109.2	107.0	105.0	104.7	104.6	104.7	105.0	105.9	105.0
2	105.9	105.1	105.1	108.2	107.1	105.4	104.8	104.7	104.4	105.3	105.7	105.1
3	105.9	105.0	104.1	107.2	107.0	105.0	104.8	104.7	104.5	105.2	106.2	105.0
4	106.0	105.1	104.9	106.7	106.9	104.9	104.9	104.6	104.7	105.0	106.8	104.9
5	106.1	105.0	105.0	106.4	107.1	104.9	105.0	104.6	104.9	105.0	106.8	104.9
6	106.2	105.0	104.9	106.2	107.0	104.9	105.3	104.6	105.3	105.0	106.7	104.9
7	106.1	105.0	104.9	106.3	106.8	105.0	105.0	104.6	105.0	105.1	107.5	104.9
8	106.1	105.1	105.0	106.0	106.5	105.1	104.8	104.6	104.7	105.0	106.3	105.0
9	106.1	105.1	105.0	106.0	106.4	105.0	104.7	104.6	104.9	105.5	106.4	105.0
10	106.0	105.2	105.1	105.9	106.3	105.0	104.7	104.6	104.8	106.1	107.9	105.1
11	106.0	105.1	104.7	105.8	106.0	105.0	104.7	104.6	104.8	106.1	107.3	106.4
12	105.9	105.2	105.0	105.7	105.8	104.9	104.7	104.6	104.9	106.0	106.8	106.8
13	105.8	105.2	105.0	105.7	105.9	104.9	104.6	104.6	105.0	105.6	106.5	106.5
14	105.5	105.2	105.0	105.6	105.7	104.9	104.5	104.6	105.3	105.5	106.1	106.3
15	105.3	105.1	105.0	105.7	105.8	104.9	104.3	104.4	105.1	105.4	105.9	106.0
16	105.3	105.0	105.0	105.7	105.5	104.9	104.4	104.5	106.0	105.2	105.7	106.1
17	105.5	105.1	105.4	105.6	105.6	105.0	104.6	104.4	104.8	105.1	105.5	105.9
18	105.4	105.1	105.6	105.6	105.8	104.9	104.6	104.5	104.8	105.0	105.4	105.8
19	105.3	105.0	105.2	105.5	105.7	104.9	104.6	104.4	104.8	104.9	105.3	105.6
20	105.2	105.0	105.1	105.4	105.4	104.8	104.6	104.3	104.8	104.9	105.1	105.6
21	105.3	105.0	105.1	105.3	105.3	104.7	104.8	104.4	104.7	105.0	105.1	105.5
22	105.1	105.0	105.1	105.2	105.2	104.9	104.6	104.4	104.7	104.9	105.1	105.3
23	105.1	105.0	105.2	105.1	105.2	104.8	104.6	104.4	104.7	105.0	105.1	105.3
24	105.1	105.2	105.9	105.6	105.1	104.8	104.6	104.4	104.8	105.0	105.1	106.0
25	105.1	104.9	105.7	106.0	105.2	104.7	104.6	104.6	104.8	104.9	105.1	106.4
26	105.1	105.1	105.9	106.3	105.1	104.7	104.6	104.6	104.8	104.9	105.1	106.4
27	105.2	105.0	105.9	107.1	105.0	104.8	104.6	104.6	104.8	104.7	105.0	106.2
28	105.2	105.1	106.2	107.0	105.1	104.7	104.7	104.6	104.8	105.3	105.0	106.2
29	105.1	......	107.3	107.0	105.3	104.7	104.6	104.7	104.8	106.7	105.0	106.0
30	105.1	......	108.3	107.0	105.4	104.9	104.6	104.7	104.9	106.5	105.0	106.2
31	105.1	......	109.7	.....	105.3	.....	104.5	104.7	......	106.2	......	106.3

HUDSON RIVER ABOVE DAM AT FORT MILLER, N. Y.

A gage was established in the pond above the Fort Miller dam April 11, 1904, by this Department. The gage is attached to the face of the line of ice breakers extending up-stream from the dam near the left hand bank of the river. The gage is about 325 feet up-stream from the paper mill and is divided by painted tenth-foot marks from zero to 18 feet. The zero mark is at elevation 114.00. The crest of the dam is at elevation about 115.00 and is 639 feet long. Water is diverted for power purposes at the left-hand end of the dam. Power was formerly used at the right-hand end of the dam.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Dam at Fort Miller, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	116.6	115.5	115.4	119.4	118.2	116.2	115.8	114.4	115.2	116.2	117.0	116.4
2	117.0	115.6	115.3	118.9	118.3	116.6	115.9	114.9	114.4	116.4	116.8	116.0
3	116.9	115.8	115.5	118.3	118.2	116.2	116.0	115.8	114.6	116.4	117.4	115.8
4	117.0	115.4	114.6	118.0	118.1	116.0	116.1	115.6	115.3	116.2	117.6	115.8
5	117.3	115.2	115.1	117.8	118.3	116.0	116.2	115.6	116.0	116.0	117.6	115.7
6	117.6	115.4	115.0	117.6	118.0	116.0	116.6	116.0	116.4	116.4	117.5	115.6
7	117.3	115.6	115.0	117.8	118.0	116.2	116.4	115.9	116.2	116.2	118.2	115.6
8	117.4	115.5	115.2	117.4	117.8	116.4	115.8	115.8	116.2	116.0	118.7	116.2
9	117.4	115.6	115.1	117.2	117.6	116.6	115.8	115.8	116.0	116.8	118.7	116.0
10	117.4	116.2	115.8	117.0	117.6	116.2	115.7	115.8	115.8	117.1	118.4	116.2
11	117.4	115.8	114.4	116.9	117.4	116.1	115.7	115.6	116.0	117.1	118.0	117.5
12	117.2	115.6	115.4	116.8	117.3	115.8	115.8	115.6	115.9	117.0	117.8	117.7
13	117.2	115.6	115.3	116.8	117.1	115.9	115.4	115.8	116.0	116.8	117.6	117.4
14	116.6	115.6	115.4	116.9	117.0	115.8	114.1	115.6	116.1	116.6	117.4	117.4
15	116.5	115.6	115.6	116.8	117.0	115.8	114.6	115.4	116.2	116.5	117.0	117.4
16	116.8	115.2	115.6	116.8	116.8	116.0	114.5	115.5	116.2	116.2	116.8	117.0
17	116.8	115.2	116.4	116.8	116.8	116.0	114.6	115.6	116.1	116.1	116.9	116.9
18	116.1	115.4	116.2	116.7	117.0	115.9	114.6	115.6	115.8	116.0	116.5	116.8
19	115.8	115.3	116.2	116.6	117.0	115.8	114.5	115.6	115.4	115.8	116.4	116.6
20	116.6	115.4	116.1	116.5	116.6	115.7	114.4	114.9	115.4	116.1	116.2	116.8
21	116.2	115.4	116.2	116.6	116.5	115.5	114.4	115.0	115.2	116.0	116.1	116.6
22	116.0	115.2	116.2	116.3	116.4	115.8	114.8	115.0	115.6	115.8	116.1	116.8
23	115.8	115.2	116.4	116.2	116.3	116.0	114.7	114.8	114.8	116.0	116.2	117.5
24	115.8	115.8	117.2	116.7	116.2	115.8	114.8	114.7	115.4	115.8	116.5	117.2
25	115.6	114.8	117.0	117.4	116.4	115.6	114.9	115.6	115.1	115.8	116.3	117.6
26	115.8	115.6	117.1	117.6	116.5	115.1	114.4	115.2	115.4	115.7	116.1	117.4
27	116.1	115.2	117.2	118.3	116.2	115.6	114.6	115.1	115.8	116.0	116.1	117.2
28	115.8	115.2	117.6	118.4	116.4	115.6	114.2	114.6	115.9	116.4	116.1	117.2
29	115.8	......	118.4	118.2	116.5	115.8	114.2	114.7	115.8	117.6	116.2	117.5
30	115.8	......	119.2	116.2	116.6	115.8	114.2	114.8	115.8	117.4	116.0	117.2
31	115.7	......	119.6	......	116.4	......	114.4	114.8	......	117.2	......	117.4

HUDSON RIVER ABOVE CROCKER'S REEF DAM.

A gage was established above Crocker's Reef 450 feet up-stream from the head of Thompson's Island April 11, 1904, by J. A. O'Connor, for this Department. The reef has since been submerged by construction of a dam for the Barge canal. The gage is a painted scale subdivided to tenths of a foot from zero to 18 feet and is attached to the down-stream side of a large elm tree. The gage zero is at elevation 115.06. Readings are taken at 8 A. M. and 5 P. M. by Fred C. Bristol.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Croker's Reef Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	121.9	120.4	120.0	124.7	123.2	120.6	120 9	121.2	119.6	120.7	121.4	120.1
2	122.4	120.2	120.1	124.2	123.3	120.8	120.9	121.3	119.6	120.9	121.2	120.5
3	122.4	120.1	120.0	123.4	123.1	120.6	120.9	121.3	119.9	120.8	121.3	120.5
4	122.5	120.6	119.8	122.9	123.0	120.4	121.0	120.9	119.9	120.7	122.0	120.5
5	122.7	120.4	120.1	122.5	123.1	120.4	121.4	120.8	120.4	120.6	122.0	120.4
6	122.7	120.2	120.1	122.5	123.1	120.4	121.8	120.7	120.6	120.5	122.0	120.2
7	122.7	120.3	120.1	122.4	122.9	120.6	121.0	120.9	120.5	120.7	122.6	120.2
8	122.6	120.1	120.1	122.2	122.6	120.7	121.1	121.1	120.3	120.9	123.4	120.2
9	122.5	120.1	120.1	122.1	122.4	120.5	120.9	121.0	120.5	121.5	123.2	120.4
10	122.4	120.1	120.0	121.8	122.2	120.7	120.9	120.3	120.4	121.8	122.8	120.5
11	122.0	120.4	119.6	121.6	121.9	120.5	120.6	119.5	120.4	121.7	122.5	121.8
12	121.7	120.3	120.0	121.6	121.7	120.4	120.6	119.7	120.5	121.6	122.2	122.1
13	121.3	120.3	119 9	121.5	121.6	120.3	120.5	119.9	120.4	121.2	121.8	121.8
14	121.2	120.2	120.2	121.4	121.5	120.3	121.1	119.8	120.7	121.3	121.6	121.7
15	121.1	120.1	120.3	121.5	121.3	120.3	121.1	119.9	120.5	121.1	121.4	121.5
16	120.9	120.2	120.2	121.4	121.1	119.7	121.3	120.7	120.5	120.9	121.1	121.4
17	120.7	120.2	120.5	121.6	121.4	120.4	121.3	121.0	120.5	120.8	120.7	121.3
18	120.6	120.3	120.9	121.4	121.6	120.1	121.4	120.9	120.4	120.8	120.7	121.1
19	120.6	120.0	120.8	121.1	121.1	120.1	121.1	120.5	120.1	120.6	120.7	120.9
20	120.5	120.2	120.9	122.0	121.0	119.9	120.7	119.9	120.1	120.5	120.6	121.0
21	120.5	120.2	121.0	121.8	120.9	120.0	121.0	120.4	120.0	120.7	120.5	120.7
22	120.6	120.2	120.8	120.9	120.9	120.4	120.3	119.7	120.0	120.6	120.5	120.5
23	120.5	120.0	121.0	120.8	121.0	120.2	119.9	119.7	119.8	120.5	120.5	121.0
24	120.3	120.1	122.0	121.3	120.7	120.4	119.7	119.7	120.0	120.3	120.4	121.5
25	120 4	119.8	121.9	122.2	120.8	120.1	119.7	119.7	120.0	120.2	120.7	121.9
26	120.4	120.1	121.8	122.5	120.5	120.2	119.8	119.9	120.0	120.1	120.5	121.8
27	119.9	120.0	122.0	123.2	120.6	120.5	120.0	119.7	120.3	120.1	120.5	121.6
28	120 3	120.0	122.7	123.1	120.7	120.8	120.1	119.7	120.4	120.8	120.5	121.6
29	120 5	.....	123.6	123.2	120.7	120.7	120 1	119.8	120.2	122.0	120.5	121.5
30	120 3	.....	124.2	123.1	120.9	120.7	120.1	119.8	120.2	121.8	120.3	121.7
31	120 5	....	125.0	.....	120.8	.....	120.3	119.7	.....	121.6	.....	121.9

Hudson River at Mouth of Moses Kill, 2½ Miles above Fort Miller, N. Y.

This gage was established December 1, 1906. Readings are taken at 7 a. m. and 5 p. m. each day by Thomas B. Sanders. The gage is located on the left-hand bank of the Hudson river a short distance above the mouth of Moses Kill, 2½ miles above Fort Miller.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Mouth of Moses Kill, near Fort Miller, N. Y.

DAY.	Jan.	Feb.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	123.8	120.2	120.0	125 1	123.3	120.5	120.7	121.0	119.6	120.8	121.5	120.1
2	122.4	120.1	120.0	124.3	123.5	120.8	121.4	121.2	119.4	121.1	121.2	120.5
3	122.3	120.0	119.7	123.5	123.2	120.5	121.0	121.1	119.4	120.8	121.5	120.2
4	122.5	120.2	119.8	123.0	123.2	120.4	121.0	120.8	119.8	120.6	122.6	120.2
5	122.7	120.1	119 9	122.6	123.3	120.2	121.2	120.6	120.4	120.6	122.6	120.2
6	122.6	120.0	119.9	122.5	123.2	120.4	121.6	121.0	121.0	120.7	122.4	120.1
7	122.7	120.2	119.8	122.4	123.2	120.6	121.0	120.9	120.4	120.8	123.5	120.0
8	122.8	120.2	119.9	122.2	122.8	120 7	121.0	120.9	120.0	120.7	124.4	120.0
9	122.6	120.2	119.9	122.0	122.4	120.6	120.8	121.4	120.4	121.6	124.2	120.2
10	122.2	120.0	119.8	121.8	122.2	120.5	120.8	120.2	120.1	122.1	123.8	120.7
11	122.0	120.5	119.6	121.6	121.8	120.4	120.6	120.6	120.2	122.0	123.2	122.4
12	121.8	120.0	119 9	121.6	121 7	120.2	120.5	119.4	120.4	121.9	123.6	122.6
13	121.4	120 2	120.0	121.4	121.6	120.4	120.4	119.8	120.5	121.5	122.2	122.2
14	121.4	120.2	120.0	121.4	121.4	120.2	121.0	119.8	120.9	121.4	121.8	122.0
15	121.2	120.3	120.2	121.5	121.4	120.2	121.0	120.2	120.7	121.2	121.5	121.4
16	121.0	120.0	120.2	121.4	121.1	120.2	121.2	121.0	120.4	121.0	121.3	121.6
17	121.0	120.0	120.2	121.3	121.2	120.4	121.2	120.9	120.2	120.9	121.0	121.4
18	120.4	120.1	120.8	121.2	121.5	120.2	121.2	120.8	120.3	120.6	120.9	121.3

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Mouth of Moses Kill, near Port Miller, N. Y.—(Concluded).

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1007.												
19	120.4	120.1	120.8	121.2	121.0	120.2	121.1	120.2	120.0	120.6	120.8	121.1
20	120.2	120.1	120.6	121.0	121.0	120.0	120.6	120.0	119.9	120.2	120.7	121.1
21	120.8	120.0	120.6	120.9	120.9	119.8	120.5	120.2	119.8	120.6	120.6	120.9
22	120.6	120.0	120.7	120.8	120.8	120.2	119.8	119.6	119.9	120.6	120.6	120.6
23	120.4	119.9	121.0	120.8	120.8	120.0	119.8	119.6	119.8	120.4	120.6	120.6
24	120.5	120.0	122.0	121.4	120.6	120.1	119.6	119.6	119.9	120.4	120.4	122.0
25	120.3	119.6	121.8	122.2	120.8	119.9	119.6	119.6	119.8	120.2	120.7	122.2
26	120.4	120.0	121.9	122.6	120.6	120.0	119.8	119.7	120.0	120.2	120.6	122.2
27	119.9	120.0	122.0	123.4	120.5	120.6	119.8	119.8	120.2	119.8	120.4	122.0
28	120.4	120.0	122.7	123.4	120.8	120.6	119.7	119.6	120.3	120.9	120.4	122.1
29	120.2	......	123.7	123.4	120.9	120.6	119.8	119.6	120.4	122.6	120.4	121.9
30	120.2	......	124.7	123.4	120.8	120.2	119.8	119.6	120.2	122.6	120.4	122.1
31	120.2	......	125.4	......	120.8	......	120.2	119.8	......	122.2	......	122.4

HUDSON RIVER OPPOSITE MOUTH OF SNOOK KILL, 2½ MILES BELOW FORT EDWARD, N. Y.

This gage was established April 11, 1904, by J. A. O'Connor, for this Department. The gage is attached to a tree along the left-hand bank of the Hudson river between the river and the Champlain canal. It is divided from zero to 16 feet by painted tenth-foot marks and readings are taken at 9 A. M. and 5 P. M. by R. S. Metcalf. The zero of the gage is at elevation 114.59.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River of Moses Kill, near Fort Miller, N. Y.—(Concluded).

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	122.3	120.3	120.3	126.6	124.2	120.8	120.9	121.4	119.8	121.1	122.2	120.3
2	122.8	120.2	120.3	125.6	124.5	121.2	121.2	121.4	119.7	121.5	121.9	120.8
3	122.[illegible]	120.1	120.1	124.6	124.2	121.0	121.4	121.4	119.9	121.2	122.2	120.6
4	123.0	120.6	120.0	124.0	124.2	120.7	121.2	120.8	120.2	120.9	123.3	120.6
5	123.3	120.3	120.2	123.4	124.2	120.5	121.5	120.8	120.6	121.0	123.2	120.5
6	123.3	120.3	120.2	123.3	124.2	120.6	122.2	121.1	121.1	120.9	123.0	120.4
7	123.3	120.5	120.1	123.0	124.0	121.0	121.2	121.2	121.0	121.2	124.5	120.3
8	123.3	120.5	120.2	122.9	123.6	121.1	121.1	121.2	120.4	121.0	125.5	120.4
9	123.1	120.5	120.3	122.5	123.2	120.8	120.9	121.2	120.7	122.1	125.4	120.7
10	122.8	120.2	120.2	122.3	123.0	121.0	120.9	120.3	120.4	122.6	124.8	121.1
11	122.5	120.8	119.9	122.1	122.4	120.7	120.8	119.8	120.6	122.6	124.1	122.9
12	122.3	120.3	120.2	122.0	122.4	120.5	120.7	119.9	120.6	122.4	123.5	123.4
13	121.8	120.4	120.2	121.9	122.2	120.6	120.6	120.0	120.9	121.8	122.9	122.7
14	121.8	120.4	120.3	121.8	121.9	120.5	121.3	119.9	121.2	121.8	122.4	122.4
15	121.5	120.3	120.4	122.0	121.9	120.5	121.5	120.2	120.8	121.6	122.0	122.0
16	121.3	120.2	120.6	121.8	121.5	120.1	121.4	121.2	120.9	121.4	121.7	122.0
17	121.1	120.2	120.6	121.7	121.7	120.8	121.5	121.2	120.4	121.2	121.3	121.9
18	120.7	120.5	121.3	121.6	122.1	120.4	121.5	121.0	120.4	121.0	121.4	121.7
19	120.7	120.4	121.2	121.4	121.5	120.4	121.4	120.6	120.3	120.9	121.2	121.4
20	120.6	120.4	121.1	121.3	121.4	120.1	120.9	120.2	120.3	.....	121.0	121.4
21	121.2	120.4	121.0	121.1	121.3	120.1	120.7	120.5	120.2	121.0	120.9	121.3
22	120.8	120.3	121.0	121.3	121.2	120.5	120.0	119.9	120.2	120.8	120.9	121.0
23	120.7	120.2	121.4	121.1	121.2	120.2	120.0	119.9	120.0	120.6	121.0	121.2
24	120.7	120.3	122.5	121.8	121.0	120.4	119.9	119.9	120.2	120.6	120.7	122.4
25	120.6	119.9	122.3	123.0	121.2	120.2	119.9	119.8	120.1	120.4	121.0	122.8
26	120.6	120.4	122.4	123.[illegible]	120.7	121.[illegible]	120.2	120.0	120.3	120.4	121.0	122.9
27	120.2	120.3	122.5	124.5	120.8	120.8	120.1	120.0	120.5	120.2	120.8	122.5
28	120.7	120.2	123.3	124.4	121.1	120.9	120.1	119.9	120.6	121.3	120.8	122.6
29	120.5	......	124.8	124.5	121.3	120.9	120.1	119.9	120.4	123.2	120.9	122.5
30	120.4	......	125.9	124.4	121.3	121.0	120.1	119.9	120.6	122.9	120.7	122.7
31	120.6	......	127.0	......	121.2	......	120.5	120.0	......	122.6	......	123.0

HUDSON RIVER AT BRIDGE STREET, FORT EDWARD, N. Y.

This gage was established April 11, 1904, by J. A. O'Connor, for this Department. The gage is located on the down-stream end of the pier nearest the left-hand bank of the Hudson river at Bridge street bridge. This bridge is about 2,500 feet down-stream from the dam of the International Paper Co. and the river is divided by an island and the gage is located on the left-hand channel. The zero mark of the gage is at elevation 117.07. Readings are taken at 8 A. M. and 5 P. M. by B. F. Thebo. Owing to the defective condition of the gage, readings of the low stages for 1907 are approximate only.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Bridge Street, Fort Edward, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	122.0	120.6	120.1	127.8	125.1	120.9	120.9	121.1	119.6	120.9	122.5	120.6
2	123.3	120.8	120.1	126.7	125.3	120.8	121.1	121.1	119.6	121.4	122.5	120.1
3	123.1	120.1	119.9	125.3	125.1	120.9	121.1	121.1	119.7	121.2	123.6	120.1
4	123.4	121.1	119.9	124.5	125.0	120.6	121.3	120.7	119.6	120.9	123.7	120.5
5	123.9	120.6	119.9	124.1	124.9	120.4	121.8	120.7	120.3	120.9	123.7	120.5
6	123.9	120.6	119.9	123.7	125.0	120.3	122.2	120.7	121.1	121.6	124.1	120.3
7	123.8	120.6	119.9	123.3	124.9	120.7	121.6	121.1	120.9	121.8	124.8	120.3
8	123.7	120.6	119.8	123.3	124.0	121.1	121.1	121.1	120.6	121.9	126.1	120.2
9	123.6	120.6	119.7	123.0	123.6	120.9	120.7	121.1	120.6	122.0	126.2	120.3
10	123.4	120.1	119.7	122.6	123.4	120.7	120.4	120.6	120.6	122.5	125.2	120.9
11	122.9	120.6	119.7	122.1	122.9	120.6	120.3	119.6	120.6	122.1	125.1	123.0
12	122.6	120.1	119.7	122.1	122.7	120.1	120.2	119.5	120.6	122.1	124.4	123.7
13	122.1	120.4	120.0	122.1	122.6	120.1	120.1	119.5	120.5	122.1	124.0	123.0
14	122.1	120.3	120.1	122.1	122.6	120.6	120.1	119.5	120.5	121.9	123.6	122.5
15	121.6	120.3	120.1	122.1	122.3	120.3	120.3	119.5	120.5	121.5	122.1	122.1
16	121.6	120.1	120.1	121.9	122.0	120.6	121.1	119.7	120.5	121.1	121.6	122.1
17	121.3	119.6	121.0	121.6	121.9	120.6	121.2	120.8	120.6	120.8	121.1	122.0
18	120.9	120.1	121.3	121.6	121.9	120.3	121.1	121.1	120.6	120.4	120.9	121.7
19	120.9	120.6	121.1	121.5	121.6	120.1	121.1	119.9	120.6	120.3	120.7	121.7
20	120.1	120.1	121.1	121.5	121.4	120.1	120.3	119.6	120.6	120.3	120.7	121.5
21	121.3	120.3	121.1	121.5	121.3	120.1	120.2	119.6	120.6	120.3	120.6	121.5
22	120.6	120.3	121.1	121.3	121.3	120.1	120.1	119.8	120.1	120.1	120.6	121.4
23	120.8	120.3	122.6	121.1	121.0	120.3	119.6	119.7	120.1	120.1	120.6	121.4
24	120.9	120.3	122.6	121.4	120.7	120.1	119.6	119.7	120.1	120.1	120.1	122.1
25	120.9	120.3	122.6	123.2	120.3	120.1	119.6	119.6	120.1	120.1	120.7	122.4
26	120.9	120.3	122.6	123.8	120.3	120.4	119.5	120.1	120.1	.....	120.6	123.1
27	120.3	120.1	122.6	125.2	120.9	120.6	119.6	120.1	120.1	120.7	120.5	122.8
28	121.0	120.1	124.0	125.3	121.4	120.7	119.6	120.1	120.1	121.2	120.5	122.6
29	120.9	.....	125.6	125.3	121.0	120.7	119.6	120.1	120.3	123.3	120.5	122.6
30	120.6	.....	127.2	125.1	120.7	120.7	119.9	120.1	120.6	123.3	120.5	123.1
31	120.6	.....	128.5	.....	120.7	.....	120.1	120.1	.....	123.2	.....	123.5

HUDSON RIVER AT FORT EDWARD DAM.

This station, which is located at the dam of the International Paper Company, was established by Geo. W. Rafter in 1895, in connection with Upper Hudson storage surveys.* Since 1899 this station has been maintained by the U. S. Geological Survey in coöperation with this Department. The dam is of framed timber on slate rock foundation, and has but little leakage. The crest is straight, very nearly level, and 587.6 feet in length. Flash-boards are usually maintained on the dam from 15 inches to 18 inches in height. A record is kept of the height of flash-boards, and of the times of their setting and removal.

There are 62 water-wheels in the adjoining mill. These are nearly all of modern types which have been tested at the Holyoke flume. A record is kept of the daily run of each in hours, as well as of the working head, which is usually 18 feet. The discharge through the turbines is taken from diagrams expressing the flow as a function of the working head and number of wheel-hours run.

In the winter of 1896–1897, a flood spillway was cut around the south end of the dam, over which the water begins to flow whenever it reaches the level of the crest of the flash-boards. The profile of the spillway is very irregular and causes some uncertainty in the calculated flow during times of high water.

Whenever the flash-boards are off from the main dam, the flow is computed by means of coefficients derived from the United States Geological Station experiments on a model dam of similar cross-section.

With the flash-boards on, the flow has been computed from Francis' well-known formula for the thin-edged weir. During the dry season, but little water passes over the dam, the entire flow being employed to drive the turbines.

A new profile of the crest of the dam, obtained in 1906, has been used to determine the discharge for the present year.

The drainage area tributary to the Hudson above Fort Edward is 0.62 of that of the same stream above Mechanicville gaging station. The principal intervening tributaries are the Hoosic river and Batten kill, having drainage areas of 730 and 460 square miles, respectively.*

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* See report of State Engineer and Surveyor of New York, 1895, p. 105.

During the navigation season, water is diverted from Hudson river at Glens Falls feeder dam, seven miles above Fort Edward, for the supply of the Champlain canal.

Current-meter measurements have been made in the Glens Falls feeder as follows:

Current-meter Discharge Measurements of Glens Falls Feeder.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1907.		*Feet.*	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
	At First Bridge below Dam above Glens Falls.					
Nov. 26	E. F. Weeks	8.8	42.5	238	......	223
Nov. 26	E. F. Weeks	8.72	42.5	233	......	193
	At Ferry Street Bridge, Sandy Hill.					
Nov. 26	E. F. Weeks	6.38	47.5	232	......	226
Nov. 26	E. F. Weeks	6.4	47.5	231	......	200

Mean Daily Discharge, Second-feet, of Hudson River at Fort Edward Dam.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	6,164	3,646	2,410	33,973	20,240	5,049	3,900	2,546	664	7,514	10,764	4,202
2	11,625	3,583	2,142	27,712	21,580	2,621	3,557	2,145	2,411	10,070	9,462	7,021
3	11,383	3,401	2,434	22,862	21,190	5,181	5,021	1,512	2,185	9,089	11,235	3,834
4	11,928	5,029	1,670	18,185	18,740	4,193	1,485	664	2,107	4,147	15,902	3,515
5	14,052	3,223	2,865	16,599	17,600	4,394	7,470	2,782	3,332	4,278	15,029	3,179
6	14,624	3,592	2,330	15,830	18,300	4,560	10,868	2,531	8,588	7,523	14,179	2,413
7	11,742	3,780	2,323	13,658	18,800	7,763	6,704	2,295	7,043	9,048	20,241	2,515
8	14,166	3,680	2,325	13,659	16,310	8,307	3,989	2,142	6,641	6,524	24,928	2,396
9	12,716	3,890	2,547	11,768	15,680	9,092	2,247	1,934	3,869	11,148	22,836	5,759
10	12,588	4,071	1,212	11,114	11,730	8,059	2,677	1,512	2,737	12,876	19,687	3,807
11	11,123	5,232	2,722	9,582	12,730	4,854	1,420	1,247	3,121	12,568	18,056	14,490
12	10,344	3,407	2,393	9,266	11,330	3,861	2,382	2,609	2,145	11,736	15,289	16,100
13	9,062	3,976	3,094	8,996	11,470	3,861	1,180	1,512	8,149	8,106	12,820	14,480
14	9,016	3,639	2,608	7,866	9,460	3,861	332	1,512	7,217	9,486	10,850	12,278
15	7,328	3,509	1,656	9,027	8,860	3,736	2,608	1,512	5,561	7,988	9,392	8,931
16	7,156	3,123	4,304	8,326	7,740	5,274	1,602	1,512	6,358	6,564	8,218	11,889
17	4,150	1,416	1,886	7,836	8,590	4,940	1,665	1,512	3,047	5,042	6,875	10,542
18	3,892	4,269	6,297	7,256	10,810	3,235	2,221	664	2,734	4,590	7,378	9,684
19	4,003	3,499	4,424	6,468	6,970	2,859	1,602	1,429	2,083	4,766	5,614	9,235
20	1,952	3,279	5,575	6,042	8,010	1,857	1,180	1,364	1,848	4,371	4,830	8,898
21	5,180	3,443	4,930	6,085	6,910	3,316	332	1,417	1,512	5,065	5,086	7,848
22	4,014	3,436	5,680	6,474	6,240	3,808	1,512	1,348	1,363	3,398	4,964	5,473
23	3,980	3,201	6,839	4,952	6,040	2,808	1,348	1,348	1,410	3,721	5,091	8,296
24	4,080	2,024	5,544	8,086	5,620	4,477	1,512	2,032	1,512	3,474	1,596	11,105
25	4,243	2,026	8,484	13,085	6,530	2,483	1,512	1,656	1,379	3,100	5,236	10,506
26	3,623	3,593	9,788	14,887	3,900	2,838	2,608	3,153	3,223	2,734	5,296	14,709
27	3,736	1,857	10,107	20,783	5,440	2,420	3,047	1,512	2,772	1,778	5,071	12,222
28	4,902	3,023	14,289	19,407	6,610	2,861	514	1,512	3,557	5,804	4,417	13,756
29	3,391	......	24,977	21,729	6,840	2,796	3,041	1,512	1,546	13,609	5,279	11,050
30	3,174	......	30,027	22,192	7,060	1,761	1,809	1,512	5,803	13,799	4,656	14,461
31	3,918	......	32,790	......	6,240	......	2,295	1,694	......	13,078	......	15,612
Mean	7,622	3,423	6,796	13,457	11,180	4,238	2,698	1,730	3,530	7,323	10,276	9,039

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* Water-power of the Upper Hudson river is described in report of New York State Engineer and Surveyor, 1895, pages 124-154.

Monthly Discharge of Hudson River at Fort Edward Dam.
[Drainage area, 2,800 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	14,742	1,952	7,622	2.72	3.13
February	5,232	1,416	3,423	1.22	1.32
March	32,790	1,212	6,796	2.43	2.79
April	33,973	6,042	13,457	4.80	5.38
May	21,580	3,900	11,180	3.99	4.59
June	9,092	1,761	4,238	1.51	1.69
July	10,868	332	2,698	0.963	1.11
August	3,153	664	1,730	0.618	0.711
September	8,588	664	3,530	1.26	1.41
October	13,799	1,778	7,323	2.61	3.0
November	24,928	1,596	10,276	3.67	4.11
December	16,100	2,396	9,039	3.23	3.71

HUDSON RIVER ABOVE FEEDER DAM NEAR GLENS FALLS, N. Y.

Water is diverted from the Hudson river to supply Champlain canal at a State dam located about two miles up-stream from Glens Falls. The gage was established in the pond above this dam by John R. Kaley, March 9, 1905. The gage is located about 400 feet up-stream from the left-hand end of the dam and consists of a vertical scale with painted tenth-foot marks reading from zero to 12 feet, attached to a pile about 30 feet from the river bank. The gage zero is at elevation 277.966. The dam, which has a crest length of 616 feet, is at a general elevation of about 280.9. Water-power was formerly extensively used by sawmills at this dam, now mostly abandoned. Readings have been taken at 6 A. M. and 6 P. M. during 1907 by F. Sisson. The gage is maintained by this Department in coöperation with the U. S. Weather Bureau.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Feeder Dam near Glens Falls, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	282.6	281.9	281.7	286.6	285.0	282.4	282 0	281.4	281.2	282.5	283.4	282.0
2	283.4	281.8	281.8	286.0	285.0	282.7	282.0	281.4	281.1	282.7	283.4	282.1
3	283.4	281.9	281.5	285.1	284.8	282.3	281 9	281.3	281.2	282.7	283.1	282.0
4	283.5	282.0	281.6	284.6	284.8	282.1	281.9	281.1	281.2	282.4	283.9	281.9
5	283.7	282.0	281.6	284.4	284.7	282.0	282.0	281.3	281.4	282.0	283.9	281.9
6	283.7	283.1	281.7	294.2	284.7	282.0	282.8	281.4	282.4	282.3	283.7	281.8
7	283.8	282.0	281.6	284.0	284.6	282.3	282.0	281.3	282.2	282.1	284.6	281.7
8	283.8	282.1	281.6	283.9	284.3	282.5	281.7	281.3	282.0	282.1	285.4	281.7
9	283.7	282.1	281.6	283.6	284.1	282.5	281.6	281.3	282.0	283.2	285.4	281.8
10	283.7	282.0	281.4	283.5	284.1	282.4	281.6	281.2	281.6	283.5	284.9	282.2
11	283.3	282.0	281.7	283.3	283.7	282.2	281.4	281.2	281.8	283.5	284.6	283.6
12	283.0	282.0	281.7	283.2	283.6	282.0	281.3	281.4	281.8	283.4	284.6	284.0
13	282.9	281.9	281.7	283.1	283.4	281.9	281.1	281.3	282.2	282.9	283.6	283.7
14	282.7	282.0	281.7	283.1	283.1	281.9	281.0	281.2	282.5	282.8	283.4	283.5
15	282.7	281.8	281.6	283.1	283.2	281.9	281.1	281.1	282.3	282.7	283.2	283.2

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Feeder Dam near Glens Falls, N. Y.—(Continued).

DAY.	Jan.	Feb.	March.	April.	May.	June.	July	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
16	282.0	281.8	281.6	283.1	282.8	282.0	281.0	281.1	282.0	282.4	282.9	283.2
17	282.0	281.8	281.8	283.0	282.9	282.0	281.1	281.1	281.8	282.3	282.7	283.1
18	282.0	281.8	282.3	282.9	282.3	281.9	281.1	281.1	281.8	282.1	282.6	282.9
19	282.1	281.8	282.3	282.8	282.8	281.7	281.0	280.9	281.6	281.9	282.4	282.8
20	282.0	281.8	282.3	282.7	282.8	281.6	280.9	280.8	281.5	281.8	282.3	282.7
21	282.2	281.7	282.2	282.6	282.8	281.7	280.9	280.9	281.4	281.9	282.2	282.6
22	282.2	281.8	282.3	282.5	282.7	281.9	281.0	281.0	281.5	281.9	282.3	282.6
23	282.1	281.7	282.6	282.5	282.6	281.8	281.1	281.4	281.3	281.8	282.3	282.5
24	282.1	281.7	283.5	283.0	282.5	281.8	281.1	281.4	281.2	281.7	282.3	283.5
25	282.1	281.9	283.4	283.8	282.6	281.6	281.1	281.4	281.2	281.7	282.3	283.7
26	282.0	281.8	283.5	284.1	282.2	281.6	281.3	281.4	281.8	281.6	282.2	283.7
27	281.8	281.8	283.6	284.9	282.3	281.5	281.4	281.3	281.7	281.4	282.2	283.7
28	282.1	281.6	284.3	285.0	282.8	281.6	281.3	281.3	281.7	282.2	282.1	283.6
29	282.1	.....	285.3	285.0	282.7	281.5	281.4	281.2	281.6	283.7	282.1	283.6
30	281.9	.....	285.9	285.0	282.8	281.5	281.4	281.3	282.0	283.6	282.0	283.6
31	281.9	.....	286.7	.....	282.5	.....	281.5	281.3	.....	283.5	.....	284.0

HUDSON RIVER AT CORINTH, N. Y.

A gaging station was established by this Department on Hudson river at Corinth October 1, 1906. Readings are taken each morning and night by A. M. Hollister, and the record is maintained in coöperation with the U. S. Weather Bureau. Measurements of the flow at this point have been made by the U. S. Geological Survey. These measurements are connected to a gage which is read by the International Paper Company.

Mean Daily Gage Height, in Feet, of Hudson River at Corinth, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1.8	0.5	0.2	6.6	4.5	1.6	0.6	0.2	—0.3	1.2	2.4	0.8
2	2.2	0.4	0.0	5.6	4.5	1.4	0.8	0.2	—0.3	1.6	2.0	0.9
3	2.4	0.5	0.0	4.6	4.5	1.2	0.8	0.1	—0.2	1.8	3.2	0.5
4	2.6	0.5	0.0	4.1	4.7	1.0	0.8	0.1	0.4	1.2	3.5	0.4
5	3.0	0.5	0.0	3.6	4.4	1.0	0.8	0.1	1.1	1.8	3.4	0.2
6	3.1	0.5	0.0	3.5	4.5	0.8	1.4	0.0	1.4	1.4	3.0	0.2
7	3.0	0.5	0.2	3.2	4.5	0.6	0.8	0.0	1.0	1.0	5.0	0.2
8	3.0	0.5	0.2	3.0	4.4	0.4	0.4	0.0	0.6	1.4	5.5	0.3
9	2.9	0.4	0.1	2.7	3.8	0.8	0.4	0.0	0.4	2.8	5.4	0.4
10	2.5	0.4	0.1	2.4	3.4	1.0	0.3	0.0	0.4	2.8	5.6	0.9
11	2.4	0.4	0.0	2.0	3.0	0.9	0.3	0.0	0.5	2.8	4.2	3.2
12	2.4	0.5	0.0	2.0	2.8	0.9	0.6	0.0	0.6	2.8	3.6	3.4
13	1.8	0.5	0.0	2.0	2.4	0.9	0.3	0.0	1.0	2.4	3.0	3.1
14	1.5	0.5	0.2	2.0	2.0	0.8	0.3	0.0	1.5	1.8	2.6	2.8
15	1.3	0.5	0.4	2.0	2.0	0.7	0.2	0.0	1.2	1.5	2.2	2.8
16	0.9	0.6	0.4	2.0	1.9	0.8	0.1	—0.1	0.9	1.1	1.8	2.8
17	0.5	0.5	0.6	2.0	2.1	0.8	0.1	—0.2	0.6	1.0	1.8	2.6
18	0.6	0.5	0.8	1.8	2.2	0.6	0.1	—0.2	0.5	1.1	1.4	2.0
19	0.7	0.5	0.8	1.5	2.0	0.4	0.0	—0.2	0.4	1.2	1.1	1.8
20	0.8	0.5	0.8	1.5	1.7	0.4	0.0	0.2	0.2	1.0	1.0	1.6
21	0.9	0.5	0.8	1.4	1.4	0.8	—0.1	0.3	0.0	0.9	1.0	1.6
22	0.9	0.5	0.9	1.2	1.5	0.8	—0.2	0.6	0.0	0.9	1.0	1.4
23	1.0	0.5	1.6	1.2	1.6	0.6	—0.2	0.2	0.0	0.8	0.9	1.2
24	1.0	0.5	2.7	2.4	1.3	0.6	0.4	0.3	0.5	0.6	0.4	2.8
25	1.0	0.5	2.4	3.2	1.4	0.5	0.3	0.3	0.6	0.5	0.8	3.0
26	0.7	0.4	2.8	3.9	1.2	0.4	0.5	0.2	0.5	0.5	1.0	2.9
27	0.5	0.2	2.8	4.6	1.8	1.0	0.6	0.2	0.6	0.5	1.0	2.6
28	0.5	0.2	4.0	4.8	1.8	0.7	0.6	0.1	0.8	1.2	0.9	2.6
29	0.5	.....	5.2	4.9	1.8	0.4	0.5	0.0	0.8	3.1	0.8	2.8
30	0.5	.....	6.6	4.7	1.8	0.5	0.4	—0.2	1.0	3.0	0.8	3.0
31	0.5	.....	7.2	.....	1.6	.....	0.3	—0.3	.....	2.8	.....	3.0

Current-meter Discharge Measurements of Hudson River at Corinth, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
Feb. 15 *a*	Covert and Wood............	125.96	349	1,190	2.17	2,580
Feb. 16 *b*	Covert and Wood............	125.95	613	3,640	0.48	1,740

a Measurement made at highway bridge; very approximate; conditions poor; results apt to be excessive.

b Measurement made under ice cover 1,800 to 2,000 feet above highway bridge. Results may be small on account of low velocity. Average thickness of ice, 1.0 foot. Average distance water-surface to top of ice, 0.19 foot. No ice at gage, and river open nearly the entire width 700 feet below gage.

SACANDAGA RIVER.

DESCRIPTION.

Sacandaga river is one of the larger tributaries of the upper Hudson. It drains extensive portions of the southeast slope of the Adirondack region as well as a portion of the plateau lying north of Mohawk river and south of the Adirondack mountains. The head waters of the stream arise in the slopes surrounding Lake Pleasant, Sacandaga and Piseco lakes. Above Northville the drainage basin is rugged and almost completely forest-covered. From Northville to Conklinville the stream winds through a sandy valley flanked by steep slopes. The width of this valley averages about one mile from Northampton to Conklinville. Above Northampton is an extensive flat lying at elevation about 740 feet. This flat is drained by Mayville, Vly and Hann's creeks, and contains extensive swamp areas. From Northville to Conklinville, a distance along the general course of the stream of about 22 miles, there is very little fall. The elevation at Conklinville is about 720 feet. Sacandaga river enters Hudson river at Luzerne at elevation about 540 feet. The distance from Conklinville to Luzerne is about seven miles along the general course of the stream.

SACANDAGA RIVER AT NORTHVILLE, N. Y.

Observations are taken once each day, beginning December 1, 1904. The observer is A. S. Pickard. A staff gage, 16 feet in length, is attached to the down-stream end of pier of highway bridge near railroad station. The elevation of zero mark is 742.51. The water sometimes falls below the zero of this gage, and in such cases gage readings are taken from a scale attached to north end of west abutment of bridge. The station is maintained by this Department in coöperation with the U. S. Weather Bureau.

-Mean Daily Elevation of Water-surface (Barge Canal Datum) of Sacandaga River at Northville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	746.2	742.9	742.3	743.9	743.5	740.9	740.1	740.0	740.2	741.5	741.7	740.9
2	744.0	742.9	742.3	743.0	743.5	740.9	740.5	740.0	740.2	741.1	741.5	740.9
3	743.5	742.9	742.3	742.5	743.5	740.8	740.4	740.0	740.5	740.9	744.1	740.9
4	744.7	742.9	742.3	742.5	743.3	740.8	740.4	739.9	740.7	741.1	743.5	*a*
5	749.0	742.9	742.3	743.0	743.9	740.8	740.3	739.9	741.3	741.5	743.5	*a*
6	749.0	742.9	742.3	743.0	743.9	741.5	740.2	739.9	741.1	741.2	743.5	*a*
7	748.0	742.9	742.3	742.5	743.7	741.3	740.2	739.9	741.0	741.2	745.5	*a*
8	747.9	742.9	742.3	742.0	743.5	741.3	740.1	739.9	741.0	741.5	744.9	*a*
9	747.9	742.9	742.3	741.9	743.3	741.2	740.1	739.9	741.0	743.5	743.5	*a*
10	747.5	742.9	742.3	741.9	743.3	741.0	740.1	739.9	741.1	742.5	743.9	744.6
11	748.9	742.7	742.3	741.7	743.0	740.9	740.0	739.9	741.1	742.0	742.5	744.5
12	747.5	742.7	742.3	741.5	743.0	740.7	740.2	739.9	742.0	742.3	742.3	743.3
13	747.3	742.7	742.3	741.5	742.8	740.5	740.5	739.9	741.1	741.9	742.2	741.5
14	747.3	742.7	742.3	741.3	742.5	740.5	740.4	739.9	741.0	741.5	741.9	741.7
15	747.0	742.5	742.3	741.3	742.1	740.5	740.2	739.9	740.9	741.3	741.5	*a*
16	745.5	742.5	742.3	741.3	742.0	740.5	740.2	739.9	740.7	741.2	741.3	*a*
17	744.5	742.5	742.3	741.1	742.0	740.5	740.2	739.9	740.7	741.2	741.3	*a*
18	743.9	742.5	742.5	741.0	742.0	740.4	740.3	739.9	740.7	741.1	741.2	*a*
19	743.5	742.5	742.9	741.0	741.9	740.4	740.3	739.9	740.7	740.9	741.0	*a*
20	743.5	742.5	743.3	740.9	741.7	740.4	740.3	739.9	740.7	740.9	741.0	*a*
21	743.5	742.5	744.0	740.9	741.7	740.3	740.3	739.9	740.7	740.9	740.9	*a*
22	743.5	742.5	745.0	740.9	741.5	740.3	740.3	739.9	740.7	740.9	741.1	*a*
23	743.5	742.5	746.9	740.9	741.5	740.1	740.3	739.9	740.7	740.8	741.1	*a*
24	743.3	742.5	748.4	744.0	741.5	740.1	740.2	739.9	740.9	740.8	741.0	746.5
25	743.1	742.5	747.5	744.0	741.3	740.1	740.2	740.1	740.9	740.7	741.0	745.0
26	742.9	742.3	746.5	743.5	741.1	740.1	740.2	740.1	740.9	740.7	741.0	743.2
27	742.9	742.3	746.3	745.0	741.1	740.1	740.2	740.1	740.9	740.7	741.0	742.7
28	742.9	742.3	753.3	743.7	741.1	740.1	740.1	740.2	740.9	743.3	741.0	742.0
29	742.9	.....	746.8	743.5	741.0	740.1	740.1	740.2	740.9	744.0	740.9	742.3
30	742.9	.....	746.3	743.3	741.0	740.1	740.1	740.2	742.2	743.0	740.9	742.3
31	742.9	.....	744.9	.....	740.9	.....	740.1	740.2	.....	743.0	.....	742.5

a Ice obstruction.

Indian River at Indian Lake, N. Y.

A record of the stage of water in Indian lake reservoir, located in the upper Hudson river basin, as described in preceding reports, has been continued. The stage of water in the reservoir is shown in the following table:

Mean Daily Gage Height, in Feet, of Indian River at Indian Lake, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	5.55	10.5	4.0	12.05	23.35	29.85	32.10	30.6	22.45	22.1	28.0	33.25
2	5.75	10.5	4.75	12.9	23.80	29.90	32.15	30.45	22.2	22.15	28.1	33.3
3	6.05	10.2	3.5	13.35	24.40	29.95	32.25	30.25	21.95	22.35	28.75	33.35
4	6.4	10.0	3.25	13.85	25.00	30.00	32.35	30.05	21.9	22.4	29.15	33.4
5	6.75	9.85	3.0	14.15	25.75	30.05	32.35	29.85	21.85	22.6	29.35	33.4
6	7.0	9.65	2.75	14.5	26.25	30.10	32.4	29.6	22.05	22.75	29.65	33.45
7	7.75	9.4	2.5	14.85	26.60	30.30	32.45	29.35	22.10	22.85	30.0	33.5
8	7.5	9.25	2.25	15.15	26.90	30.35	32.5	29.2	22.15	22.45	30.4	33.55
9	7.75	9.0	2.0	15.35	27.25	30.4	32.5	29.0	22.20	24.05	30.85	33.6
10	8.05	8.85	2.0	15.6	27.50	30.5	32.5	28.75	22.25	24.35	31.15	34.1
11	8.3	8.6	2.0	15.75	27.75	30.6	32.5	28.55	22.60	24.7	31.35	34.85
12	8.5	8.35	2.0	15.95	28.00	30.65	32.6	28.3	23.05	25.0	31.55	35.1
13	8.7	8.15	2.0	16.15	28.10	30.75	32.65	28.05	23.3	25.2	31.70	35.25
14	8.85	8.0	2.0	16.3	28.25	30.85	32.70	27.8	23.5	25.35	31.85	35.4
15	9.0	7.85	2.0	16.4	28.35	30.9	32.75	27.55	23.6	25.55	32.0	35.5
16	9.1	7.6	2.0	16.55	28.50	31.0	32.8	27.35	23.65	25.65	32.1	35.55
17	9.15	7.35	2.0	16.65	28.65	31.1	32.8	27.1	23.75	25.75	32.15	35.55
18	9.25	7.1	2.0	16.8	28.85	31.1	32.8	26.6	23.85	25.85	32.25	35.5
19	9.35	6.85	2.5	16.9	28.90	31.15	32.8	26.1	23.85	25.9	32.35	35.45
20	9.5	6.6	3.0	17.0	29.00	31.25	32.8	25.65	23.9	25.95	32.4	35.4
21	9.6	6.35	3.5	17.1	29.10	31.35	32.8	25.25	23.95	26.0	32.5	35.35
22	9.65	6.1	4.0	17.25	29.15	31.45	32.85	24.85	23.6	26.05	32.6	35.35
23	9.8	5.85	4.5	17.35	29.25	31.60	32.6	24.4	23.35	26.1	32.7	35.4
24	9.9	5.6	5.0	17.75	29.25	31.65	32.4	24.0	23.1	26.15	32.75	35.75
25	10.0	5.35	5.5	18.4	29.30	31.70	32.15	23.6	22.85	26.2	32.85	35.9
26	10.1	5.1	6.0	19.35	29.40	31.75	32.9	23.15	22.55	26.3	32.9	36.0
27	10.25	4.6	6.4	20.15	29.60	31.8	31.8	23.75	22.35	26.35	33.0	35.9
28	10.3	4.25	7.35	20.85	29.65	31.8	31.5	23.35	22.1	26.75	33.05	35.75
29	10.35	......	8.65	21.6	29.75	31.85	31.3	23.1	22.0	27.25	33.10	35.65
30	10.4	......	10.35	22.5	29.85	32.00	31.1	22.9	21.95	27.6	33.15	35.65
31	10.5	......	11.65	......	29.70	......	30.85	22.7	......	27.85	......	35.7

DELAWARE RIVER DRAINAGE BASIN.

Description of Delaware River.

The head waters of Delaware river rise in Delaware, Greene and Schoharie counties, N. Y., the source of the main stream, which is commonly known as West branch, to distinguish it from the smaller East or Pepacton branch, being a small lake almost on the line of Schoharie and Delaware counties, at an elevation of 1,886 feet above tide. From this lake it flows southwestward across central Delaware county to Deposit, where it receives Oquaga creek, a large tributary draining eastern Broome county, and turns abruptly to the southeast, forming the boundary line between New

York and Pennsylvania until Port Jervis is reached. Here it turns again to the southwest and flows for a distance of about 40 miles along the base of the Shawangunk range until it passes through the water gap, from which point it flows irregularly southward to Trenton. Below Trenton the course is in general southwestward to Delaware Bay. South of Port Jervis it forms the dividing line between Pennsylvania and New Jersey, and for a few miles it is the boundary between Delaware and New Jersey.

East branch rises at Grand Gorge in northeastern Delaware county, and flows parallel to West branch across southern Delaware county, uniting with the latter stream at Hancock.

The total length of the river from the mouth to the head of West branch is about 410 miles; its drainage area, measured at Philadelphia and including Schuylkill river, is 10,100 square miles, of which about 2,580 square miles lie in New York, 5,750 in Pennsylvania, and 1,800 in New Jersey. The river is tidal to Trenton, which lies also at the head of navigation.

EAST BRANCH, DELAWARE RIVER, AT HANCOCK, N. Y.

This station was established October 14, 1902, by Robert E. Horton, and has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the highway bridge one-half mile southeast of the Erie railroad station at Hancock, N. Y., and one mile above the junction with West branch of the Delaware. The Erie railroad bridge is just below the station.

The channel is straight for 600 feet above and 300 feet below the station. The current is swift. Both banks are of medium height and are not liable to overflow. The bed of the stream is composed of rocks and gravel. There are three channels at low water and five channels at high water. During low water the elevation of the water-surface at the station is lower than the water-surface on West branch of the Delaware, but the gage heights are probably not affected by backwater from West branch, as there is considerable fall between the gaging station and the junction of the branches.

Discharge measurements are made from the down-stream side of the five-span iron highway bridge to which the gage is attached.

The bridge has a total span of 425.5 feet between abutments. The initial point for soundings is the face of the right abutment at the top.

A standard chain gage is attached to the lower chord of the second span from the left end of the bridge on the up-stream side. It was installed July 21, 1903, to replace the old wire gage. The gage datum was not changed. The length of the chain from the end of the weight to the marker is 32.43 feet. The gage is read twice each day by D. B. Van Etten. The bench-mark is a circular chisel draft on the top of the left abutment on the down-stream side. It is marked "B. M." Its elevation is assumed to be 100.00. The elevation of the top of the gage pulley is 104.47. The elevation of water-surface, when the gage reads zero, is 72.07.

Mean Daily Gage Height, in Feet, of East Branch, Delaware River, at Hancock, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.		*a*					*b*					
1	6.65	......	*a*	5.00	4.30	3.50	......	*b*	2.20	3.50	4.80	3.60
2	5.40	......	*a*	4.70	4.15	3.55	......	*b*	2.20	3.30	4.60	3.50
3	4.95	......	*a*	4.50	4.10	4.05	......	*b*	2.30	3.10	6.80	3.50
4	5.15	......	*a*	4.30	4.05	3.80	......	*b*	2.60	3.20	6.00	3.50
5	5.30	......	*a*	4.25	4.50	3.70	......	*b*	2.80	5.10	5.80	3.40
6	4.85	......	*a*	4.15	4.15	4.15	......	*b*	2.70	4.40	4.90	3.30
7	4.70	......	*a*	3.95	4.30	4.10	......	*b*	2.70	4.10	*c*8.80	3.40
8	5.40	......	*a*	3.90	4.55	4.00	......	2.50	2.60	3.90	8.30	3.60
9	5.35	......	*a*	4.00	4.45	3.90	......	2.40	2.50	4.90	6.40	3.50
10	4.85	......	*a*	4.00	4.45	3.80	......	2.40	2.60	4.30	5.60	4.70
11	4.75	......	*a*	3.90	4.30	3.70	......	2.40	2.80	4.10	5.30	*c*10.40
12	4.50	......	*a*	4.15	4.20	3.65	......	2.40	4.10	4.00	4.90	7.10
13	4.40	......	*a*	4.10	4.10	3.60	......	2.30	3.50	4.00	4.60	5.70
14	4.30	......	*a*	4.30	3.95	3.50	......	2.30	3.10	3.80	4.50	5.20
15	4.45	......	7.70	4.15	3.85	3.45	......	2.30	2.90	3.70	4.30	4.90
16	4.15	......	6.00	4.05	3.85	3.35	......	2.30	2.80	3.60	4.10	4.70
17	4.30	......	5.65	4.00	4.30	3.30	......	2.30	2.70	3.50	4.00	4.50
18	3.80	......	5.55	3.95	4.15	3.20	......	2.30	2.70	3.40	3.90	4.40
19	4.20	......	5.65	3.90	4.00	3.20	......	2.30	2.60	3.30	3.80	4.20
20	4.70	......	4.80	3.85	3.95	3.50	......	2.30	2.60	3.30	3.80	4.00
21	4.95	......	4.55	3.75	3.80	3.35	......	2.30	2.60	3.20	3.70	4.00
22	4.15	......	4.75	3.70	3.70	3.15	......	2.20	2.60	3.40	3.80	3.90
23	3.85	......	6.30	3.75	3.70	3.05	......	2.20	2.70	3.30	3.80	4.10
24	4.75	......	7.00	4.30	3.65	3.00	......	2.30	2.80	3.40	3.70	8.50
25	8.25	......	6.15	4.95	3.55	2.95	......	2.30	3.10	3.40	3.70	6.40
26	5.25	......	5.75	4.80	3.55	2.90	......	2.30	2.90	3.30	3.70	5.40
27	*a*	......	5.45	4.75	3.75	2.90	......	2.30	2.80	3.20	3.70	5.00
28	*a*	......	5.95	4.55	3.90	3.00	......	2.30	2.70	3.60	3.60	4.90
29	*a*	......	6.40	4.40	3.75	2.90	......	2.30	2.80	7.40	3.60	5.30
30	*a*	......	6.10	4.30	3.60	3.05	......	2.20	3.60	6.10	3.60	4.80
31	*a*	......	5.40	......	3.60	......	......	2.20	......	5.30	......	5.30

a Ice obstruction.
b No record.
c Above rating curve.

Current-meter Discharge Measurements of East Branch, Delaware River, at Hancock, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
June 21	Wood and Hoyt............	3.32	324	726	1.31	955

Rating table for East Branch, Delaware River, at Hancock, N. Y., for 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
2.50	135	3.70	1,300	4.90	3,710	6.20	7,365
2.60	175	3.80	1,450	5.00	3,960	6.40	8,025
2.70	225	3.90	1,610	5.10	4,215	6.60	8,730
2.80	285	4.00	1,780	5.20	4,475	6.80	9,460
2.90	355	4.10	1,960	5.30	4,740	7.00	10,210
3.00	440	4.20	2,150	5.40	5,010	7.20	10,980
3.10	540	4.30	2,350	5.50	5,285	7.40	11,760
3.20	650	4.40	2,560	5.60	5,565	7.60	12,560
3.30	770	4.50	2,780	5.70	5,850	7.80	13,360
3.40	890	4.60	3,000	5.80	6,140	8.00	14,200
3.50	1,020	4.70	3,230	5.90	6,435	8.20	15,040
3.60	1,160	4.80	3,470	6.00	6,735	8.40	15,920

The above table is applicable only for open-channel conditions. It is based upon 15 discharge measurements made during 1904–1906. It is fairly well defined between gage heights 2.9 feet and 7.5 feet.

Mean Daily Discharge, Second-feet, of East Branch, Delaware River, at Hanocck, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.	*a*	*a*					*b*					
1	.....	.....	*a*	3,960	2,350	1,020	.....	*b*	45	1,020	3,470	1,160
2	.....	.....	*a*	3,230	2,060	1,090	.....	*b*	45	770	3,000	1,020
3	.....	.....	*a*	2,780	1,960	1,870	.....	*b*	70	540	9,460	1,000
4	.....	.....	*a*	2,350	1,870	1,450	.....	*b*	175	650	6,740	1,020
5	.....	.....	*a*	2,250	2,780	1,300	.....	*b*	285	4,220	6,140	890
6	.....	.....	*a*	2,060	2,060	2,060	.....	*b*	225	2,560	3,710	770
7	.....	.....	*a*	1,740	2,350	1,960	.....	*b*	225	1,960	*c*17,800	890
8	.....	.....	*a*	1,610	2,890	1,780	.....	135	175	1,610	15,500	1,160
9	.....	.....	*a*	1,780	2,670	1,610	.....	100	135	3,710	8,020	1,020
10	.....	.....	*a*	1,780	2,670	1,450	.....	100	175	2,350	5,560	3,230
11	.....	.....	*a*	1,610	2,350	1,300	.....	100	285	1,960	4,740	*c*26,100
12	.....	.....	*a*	2,060	2,150	1,230	.....	100	1,960	1,780	3,710	10,600
13	.....	.....	*a*	1,960	1,960	1,160	.....	70	1,020	1,780	3,000	5,850
14	.....	.....	*a*	2,350	1,700	1,020	.....	70	540	1,450	2,780	4,480
15	.....	.....	12,960	2,060	1,530	955	.....	70	355	1,300	2,350	3,710
16	.....	.....	6,740	1,870	1,530	830	.....	70	285	1,160	1,960	3,230
17	.....	.....	5,710	1,780	2,350	770	.....	70	225	1,020	1,780	2,780
18	.....	.....	5,420	1,700	2,060	650	.....	70	225	890	1,610	2,560
19	.....	.....	5,710	1,610	1,780	650	.....	70	175	770	1,450	2,150
20	.....	.....	3,470	1,530	1,700	1,020	.....	70	175	770	1,450	1,780
21	.....	.....	2,890	1,380	1,450	830	.....	70	175	650	1,300	1,780
22	.....	.....	3,350	1,300	1,300	595	.....	45	175	890	1,450	1,610
23	.....	.....	7,690	1,380	1,300	490	.....	45	225	770	1,450	1,960
24	.....	.....	10,210	2,350	1,230	440	.....	70	285	890	1,300	16,400
25	.....	.....	7,200	3,840	1,090	397	.....	70	540	890	1,300	8,020
26	.....	.....	6,000	3,470	1,090	355	.....	70	355	770	1,300	5,010
27	.....	.....	5,150	3,350	1,380	355	.....	70	285	650	1,300	3,960
28	.....	.....	6,580	2,890	1,610	440	.....	70	225	1,160	1,160	3,710
29	.....	.....	8,020	2,560	1,380	355	.....	70	285	11,800	1,160	4,740
30	.....	.....	7,040	2,350	1,160	490	.....	45	1,160	7,040	1,160	3,470
31	.....	.....	5,010	.....	1,160	.....	.....	45	.....	4,740	.....	4,740
Mean	.....	.....	6,420	2,230	1,840	997	.....	74	350	2,020	3,900	4,220

a Ice obstruction.
b No record.
c Above rating curve.

Monthly Discharge of East Branch, Delaware River, at Hancock, N. Y.
[Drainage area, 920 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
March (17 days)	12,960	2,890	6,420	7.00	8.05
April	3,960	1,300	2,230	2.43	2.72
May	2,890	1,090	1,840	2.01	2.31
June	2,060	355	997	1.09	1.22
July	....	....	....	....	....
August (24 days)	135	45	74	0.081	0.093
September	1,960	45	350	0.382	0.428
October	11,800	540	2,020	2.20	2.53
November	[a]17,800	1,160	3,900	4.25	4.76
December	[a]26,100	770	4,220	4.60	5.29

[a] Above rating curve.

WEST BRANCH, DELAWARE RIVER, AT HANCOCK, N. Y.

This station was established October 15, 1902, by Robert E. Horton, and has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located one-half mile west of the Erie railroad station at Hancock, N. Y., and about one mile above the mouth of East branch.

The channel is straight for 400 feet above and 800 feet below the bridge. The current is swift. Both banks are high and rocky and are not subject to overflow. The bed of the stream is composed of earth and cobblestones.

Discharge measurements are made from the down-stream side of the bridge, at which the gage is located. The bridge has a single span of 235 feet. The initial point for soundings is the top of the face of the left abutment on the down-stream side. The bridge floor is marked at intervals of five feet with black paint.

The original wire gage was attached to the up-stream side of the bridge. It was replaced July 20, 1903, by a standard chain gage. The location and the gage datum were not changed. The length of the chain from the end of the weight to the marker is 30.44 feet. The gage is read twice each day by David Pulver, the collector of tolls at the bridge. The bench-mark is a circular chisel draft on the up-stream corner of the left abutment. Its elevation is assumed at 100.00. The elevation of the top of the pulley is 106.29. The elevation of water-surface, when the gage reads zero, is 75.75.

Current-meter Discharge Measurements of West Branch, Delaware River, at Hancock, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907. June 21. .	Wood and Hoyt	3.26	200	389	1.02	397

Mean Daily Gage Height, in Feet, of West Branch, Delaware River, at Hancock, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	6.55	4.00	3.90	4.95	5.10	3.45	3.50	2.60	2.30	3.80	4.10	3.50
2	5.40	4.00	4.05	4.60	4.90	3.50	3.40	2.70	2.30	3.60	4.50	3.50
3	4.95	3.90	4.15	4.45	4.65	3.55	3.30	2.70	2.40	3.40	5.90	3.50
4	5.90	3.90	4.20	4.30	4.55	3.55	3.10	2.90	2.80	4.00	5.50	3.30
5	5.65	4.00	4.25	4.20	4.65	3.45	3.10	3.00	3.70	5.70	5.10	3.30
6	5.05	4.05	4.20	4.10	4.40	3.70	3.00	2.80	3.60	5.00	4.80	3.20
7	a5.00	4.40	4.10	3.90	4.40	3.85	3.30	2.80	3.10	4.50	7.60	4.20
8	5.40	4.55	4.00	3.90	4.85	3.85	3.10	2.80	3.00	4.50	7.80	5.10
9	5.40	4.50	3.90	4.15	4.65	3.70	3.00	2.70	3.10	5.50	6.40	4.30
10	4.70	4.50	4.00	4.10	4.55	3.55	2.80	2.60	3.60	4.80	5.70	6.40
11	4.75	4.35	3.95	4.05	4.35	3.50	2.80	2.60	4.00	4.50	5.30	10.00
12	4.60	4.25	3.80	4.15	4.25	3.45	3.00	2.40	4.90	4.50	4.90	7.10
13	4.40	4.25	3.85	4.30	4.20	3.45	3.50	2.50	4.40	4.30	4.50	6.00
14	4.45	4.55	4.20	4.40	4.10	3.30	3.10	2.40	3.90	4.10	4.50	5.80
15	4.60	4.50	7.85	4.25	3.92	3.25	3.10	2.40	3.60	4.00	4.30	5.30
16	4.15	4.30	5.35	4.20	3.90	3.20	3.10	2.40	3.40	3.80	4.10	5.00
17	3.90	4.00	5.75	4.20	4.05	3.20	2.80	2.30	3.20	3.70	4.00	4.80
18	3.65	4.05	5.60	4.15	4.00	3.10	3.00	2.30	3.00	3.50	3.80	4.50
19	4.45	4.00	5.60	4.00	3.90	3.10	3.00	2.30	3.10	3.50	3.80	4.40
20	5.15	4.10	4.90	4.00	3.95	3.25	3.10	2.30	3.00	3.30	3.80	4.00
21	4.90	4.00	4.55	3.90	3.80	3.25	2.80	2.40	3.00	3.60	3.80	4.20
22	4.25	3.90	5.10	3.85	3.75	3.15	2.90	2.40	3.10	3.60	3.80	3.90
23	3.50	4.05	6.70	3.90	3.65	3.00	2.90	2.30	3.20	3.50	3.70	4.10
24	3.55	4.20	6.75	4.40	3.60	3.05	2.90	2.40	3.60	3.50	3.60	8.60
25	3.55	4.35	6.25	4.75	3.55	3.00	2.80	2.40	3.50	3.30	3.80	6.90
26	4.20	4.05	5.80	4.70	3.55	2.95	3.00	2.30	3.30	3.20	3.70	5.90
27	4.50	3.90	5.50	5.35	3.75	3.20	2.90	2.30	3.10	3.10	3.80	5.40
28	4.30	3.90	5.75	5.00	3.85	3.30	2.80	2.40	3.20	4.20	3.60	5.80
29	4.30	....	6.00	4.85	3.55	3.15	3.00	2.30	3.40	6.30	3.40	5.90
30	4.25	....	5.65	4.70	3.50	3.25	2.50	2.20	3.90	5.70	3.70	5.20
31	3.95	....	5.25	....	3.40	....	2.60	2.20	....	5.10	....	5.40

a River frozen over from January 7 to March 16.

Rating table for West Branch, Delcware River, at Hancock, N. Y., for 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
2.60	100	3.70	695	4.80	2,130	6.20	5,230
2.70	130	3.80	790	4.90	2,300	6.40	5,780
2.80	165	3.90	890	5.00	2,470	6.60	6,340
2.90	205	4.00	1,000	5.10	2,650	6.80	6,920
3.00	245	4.10	1,120	5.20	2,840	7.00	7,510
3.10	290	4.20	1,250	5.30	3,040	7.20	8,120
3.20	340	4.30	1,380	5.40	3,250	7.40	8,740
3.30	400	4.40	1,520	5.50	3,470	7.60	9,380
3.40	465	4.50	1,660	5.60	3,700	7.80	10,020
3.50	535	4.60	1,810	5.80	4,190	8.00	10,680
3.60	610	4.70	1,970	6.00	4,700		

The above table is applicable only for open-channel conditions. It is based upon 6 discharge measurements made during 1906 and measurements made in previous years. It is fairly well defined.

Mean Daily Discharge, Second-feet, of West Branch, Delaware River, at Hancock, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	......	......	......	2,380	2,650	500	535	100	40	790	1,120	535
2	......	......	......	1,810	2,300	535	465	130	40	610	1,660	535
3	......	......	......	1,590	1,890	572	400	130	55	465	4,440	535
4	......	......	......	1,380	1,740	572	290	205	165	1,000	3,470	400
5	......	......	......	1,250	1,890	500	290	245	695	3,940	2,650	400
6	......	......	......	1,120	1,520	695	245	165	610	2,470	2,130	340
7	......	......	......	890	1,520	840	400	165	290	1,660	9,380	1,250
8	......	......	......	890	2,220	840	290	165	245	1,660	10,020	2,650
9	......	......	......	1,180	1,890	695	245	130	290	3,470	5,780	1,380
10	......	......	......	1,120	1,740	572	165	100	610	2,130	3,940	5,780
11	......	......	......	1,060	1,450	535	165	100	1,000	1,660	3,040	18,100
12	......	......	......	1,180	1,320	500	245	55	2,300	1,660	2,300	7,820
13	......	......	......	1,380	1,250	500	535	75	1,520	1,380	1,660	4,700
14	......	......	......	1,520	1,120	400	290	55	890	1,120	1,660	3,040
15	......	......	......	1,320	918	370	290	55	610	1,000	1,380	3,040
16	......	......	3,140	1,250	890	340	290	55	465	790	1,120	2,470
17	......	......	4,060	1,250	1,060	340	165	40	340	695	1,000	2,130
18	......	......	3,700	1,180	1,000	290	245	40	245	535	790	1,660
19	......	......	3,700	1,000	890	290	245	40	290	535	790	1,520
20	......	......	2,300	1,000	945	370	290	40	245	400	790	1,000
21	......	......	1,740	890	790	370	165	55	245	610	790	1,250
22	......	......	2,650	840	742	315	205	55	290	610	790	790
23	......	......	6,630	890	652	245	205	40	340	535	695	1,120
24	......	......	6,780	1,520	610	268	205	55	610	535	610	12,700
25	......	......	5,370	2,050	572	245	165	55	535	400	790	7,220
26	......	......	4,190	1,970	572	225	245	40	400	340	695	4,440
27	......	......	3,470	3,140	742	340	205	40	290	290	790	3,250
28	......	......	4,060	2,470	840	400	165	55	340	1,250	610	4,190
29	......	......	4,700	2,220	572	315	245	40	465	5,500	465	4,190
30	......	......	3,820	1,970	535	370	75	30	890	3,940	695	2,840
31	......	......	2,940	......	465	......	100	30	......	2,650	......	3,250
Mean	......	......	3,953	1,457	1,203	445	260	83.4	512	1,440	2,201	3,372

Monthly Discharge of West Branch, Delaware River, at Hancock, N. Y.

[Drainage area, 680 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
March (16 days)	6,780	1,740	3,950	5.81	6.68
April	3,140	840	1,460	2.15	2.41
May	2,650	465	1,200	1.76	2.02
June	840	225	445	0.654	0.732
July	535	75	260	0.382	0.439
August	245	30	83.4	0.122	0.14
September	2,300	40	512	0.753	0.843
October	5,500	290	1,440	2.12	2.44
November	10,020	465	2,200	3.23	3.62
December	18,100	340	3,370	4.95	5.69

SUSQUEHANNA RIVER DRAINAGE BASIN.

DESCRIPTION OF SUSQUEHANNA RIVER.

Susquehanna river rises in Otsego lake, in northern Otsego county, N. Y., at an elevation of 1,193 feet above tide and flows in a general southerly direction into Chesapeake bay. Its course is in many places extremely tortuous, crossing the state boundary between New York and Pennsylvania three times. The entire length of the river is about 500 miles, and it drains an area of 27,400 square miles, of which 21,060 square miles lie in Pennsylvania, 6,080 in New York, and 260 in Maryland.

The topography of the basin varies widely in character. In New York the stream and its tributaries flow through a rolling and in places rather broken country, bounded on the north by a mountainous area. In this part of the course its bed is of gravel or sand, with occasional rock ledges, and its banks are moderately high and not extensively subject to overflow. In Pennsylvania the river enters a mountain region, its banks are high, and it winds and twists among the parallel ranges in a bed composed generally of drift materials, gravel, sand and boulders. In the lower part of its course, from Marietta to Havre de Grace, it occupies a broad, deep valley, varying in width from a few hundred feet to more than a mile, and is for the most part bounded on either shore by rocky bluffs and table-lands elevated from 100 to 500 feet above its waters.

SUSQUEHANNA RIVER AT BINGHAMTON, N. Y.

This station was established July 31, 1901, by Robert E. Horton, and has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the Washington street bridge, about 800 feet up-stream from the junction of Chenango and Susquehanna rivers.

On account of the unfavorable conditions produced by a rift, which extends diagonally across the stream underneath the Washington street bridge, discharge measurements are made at the Exchange street bridge, 1,900 feet up-stream.

A standard chain gage is attached to the up-stream side of the left span of the Washington street bridge. The gage is up-stream from the crest of the rift and over a stretch of smooth water extending to the dam, 2,800 feet above. Gage readings are unaffected by backwater from Chenango river at ordinary stages. The gage is read twice each day by William Ray Monroe. The bench-mark is a chisel draft on the corner of the left bridge abutment on the up-stream side. Its assumed elevation is 100.00. The elevation of water-surface, when the gage reads zero, is 76.29. The results of gagings at this station in 1907 are not at present available.

SUSQUEHANNA RIVER AT COLLIERSVILLE, N. Y.

During 1907 a hydro-electric development has been made about one mile north of Colliers, on the Susquehanna river. This consists of a reinforced concrete dam, affording a head of from 31 to 33 feet, with rollway 200 feet long, with an installation of two 1,000-KW. units. Power is transmitted to the power-house of the Oneonta & Mohawk Valley R. R. Co., at Hartwick.

During a portion of 1907 gagings of flow of Susquehanna river were made at this point under the direction of Wm. Barclay Parsons, Consulting Engineer on the above plant, and these data have been supplied through his courtesy.

The gagings were by float measurements made with a bottle arranged to float just under the surface, and were made to ascertain approximately the relative flow of the river at different times, no especial care being taken to get accurate results. To the figures obtained in this way a coefficient of 0.90 has been applied and results are given in the accompanying table.

The drainage area at this point is about 300 square miles, and the flow here is well sustained during the low-water season by the storage afforded by Schuyler and Otsego lakes.

Mean Daily Discharge, Second-feet, of Susquehanna River at Colliersville, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1								246	128			
2							557	167	110			
3							375	194	158			
4							302	194	481			
5						396	253	160	790			
6						455	229	247	459			
7						513		283	346			
8						449	194	248	346			
9							231	194	346			
10						380	207	194	388			
11						320	221	182	425			
12						311		194	504			
13						248		203	423			
14						239		168	367			
15						239		173	328			
16							374	168	327			
17						181	374	198	344			
18					716	194	641	169	302			
19						227	342	148	281			
20						215	544	146	237			
21						233	470	170				
22					472	204	391	190				
23							314	111	253			
24					414	183	314	109	477			
25						219	407	105	365			
26						194	378	146	347			
27							337	103	342			
28							292	111	347			
29							267	122	482			
30							261	94	780			
31							246	121				
Mean					534	284	341	170	374			

NOTE.—Above data supplied by Wm. Barclay Parsons, and is result of gagings made by floats, and were made to ascertain the approximate flow only.

CHENANGO RIVER AT BINGHAMTON, N. Y.

Chenango river rises in central Madison county, N. Y., in the towns of Eaton and Madison, flows southward, and unites with the Susquehanna at Binghamton. Its head-water valleys lie at an elevation of about 1,200 feet above tide. The elevation of its mouth above tide is 864 feet. Its length is, approximately, 70 miles and its drainage area is 1,580 square miles.

The gaging station, which was established July 31, 1901, by Robert E. Horton, has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the Court street bridge, Binghamton.

The bridge to which the gage is attached stands squarely across the stream at a point where there is a good bed of gravel and small cobblestones and a smooth, uniform current. The channel is obstructed by three masonry piers supporting the four spans of the bridge, 79 feet clear width each, the bridge having a total length of 337 feet between abutments. A small rift between the station and the confluence of Chenango river with the Susquehanna, about 2,500 feet below, cuts off backwater at ordinary stages of the rivers. For periods during freshets or at times when there is an abnormal rise on one or both streams, either record may be affected by backwater and too great a discharge indicated.

A standard chain gage is attached to the hand-rail of the bridge on the up-stream side of the first span from the right bank. The gage is read by William Ray Monroe. The bench-mark is a circular chisel draft on the up-stream corner of the bridge-seat on the left abutment. Its assumed elevation is 100.00. The elevation of water-surface, when the gage reads zero, is 65.98.

In estimating the run-off of Chenango river, the area directly tributary to storage reservoirs, from which diversion is made to supply Erie canal, has been deducted from the total natural drainage area. The diversion area of six reservoirs at the head of Chenango river, whose outflow is turned into Erie canal through Oriskany creek, is about 30 square miles. The diversion area of De Ruyter reservoir, at the head of Tioughnioga river, whose outflow is turned into Erie canal through Limestone creek, is 18.2 square miles. These two areas have been subtracted from the natural drainage area of 1,580 square miles, giving an effective area of 1,532 square miles. This estimate is approximate, as no allowance for direct inflow to feeder channels from additional areas, nor for waste into the original stream, has been made. The gross area, from which more or less run-off is diverted, is about 105 square miles.

Mean Daily Gage Height, in Feet, of Chenango River at Binghamton, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	12.65	6.15	5.40	8.15	9.70	6.05	6.10	5.60	5.00	6.45	6.80	6.55
2	12.55	6.15	5.40	7.50	9.70	6.05	6.20	5.55	4.95	6.10	6.60	6.45
3	9.70	6.30	5.30	7.35	8.45	6.15	6.50	5.60	5.00	6.00	8.55	6.35
4	11.85	6.85	5.35	7.10	8.35	6.10	6.00	5.70	5.15	6.30	8.95	6.35
5	13.80	6.05	5.45	7.00	8.00	6.05	5.85	5.55	6.00	8.75	8.15	6.00
6	11.00	6.00	5.30	6.95	7.55	6.10	5.65	5.50	6.10	8.05	7.65	6.20
7	9.70	6.20	5.55	6.80	7.45	6.50	5.60	5.40	6.05	7.90	12.65	6.05
8	10.20	5.95	5.30	6.60	8.20	6.75	5.50	5.30	5.85	9.25	13.35	6.05
9	10.80	5.85	5.30	6.85	7.85	6.70	5.45	5.25	5.45	10.65	11.70	6.20
10	9.50	5.70	5.35	7.05	7.70	6.60	5.40	5.25	5.80	9.30	10.30	13.50
11	8.40	5.60	5.40	7.20	7.45	6.30	5.38	5.30	9.10	8.10	8.95	16.00
12	7.90	6.10	5.40	7.15	7.20	6.05	6.40	5.30	9.95	8.50	8.30	13.50
13	7.45	5.90	5.35	7.20	6.90	6.00	6.50	5.25	8.45	8.35	7.90	10.20
14	7.45	5.70	5.50	7.20	6.80	5.90	6.30	5.20	6.70	7.65	7.50	8.95
15	8.00	5.90	7.05	7.05	6.65	5.85	5.90	5.10	6.40	7.35	7.15	8.50
16	7.55	5.65	10.15	6.90	6.70	5.80	5.75	5.15	6.10	6.95	6.90	8.25
17	6.50	6.15	10.35	6.95	6.70	5.80	5.50	5.15	6.00	6.75	6.80	7.95
18	6.50	5.70	10.55	6.95	6.65	5.70	5.55	5.20	5.80	6.60	6.60	7.65
19	6.90	5.60	10.70	6.85	6.65	5.65	5.60	5.20	5.70	6.45	6.65	7.40
20	9.90	6.20	9.15	6.75	6.70	5.65	5.60	5.10	5.70	6.35	6.60	7.00
21	10.20	5.60	7.90	6.60	6.50	5.60	5.65	5.15	5.70	6.60	6.50	7.20
22	7.80	5.75	8.40	6.45	6.30	5.65	5.65	5.10	6.15	6.60	6.55	6.90
23	6.40	5.50	11.90	6.45	6.20	5.65	5.55	5.10	5.95	6.40	6.45	8.30
24	6.20	5.50	12.70	7.25	6.15	5.60	5.60	5.05	6.00	6.25	6.35	14.10
25	6.30	5.40	11.75	9.90	6.05	5.50	5.80	5.05	6.05	6.10	6.35	13.65
26	6.50	5.45	10.45	9.25	6.30	5.35	6.50	5.00	6.05	6.05	6.40	10.75
27	6.30	5.50	9.55	11.90	6.85	5.40	6.35	5.05	5.90	6.00	6.40	9.30
28	6.40	5.40	9.80	10.05	7.05	5.65	6.05	5.05	5.85	7.20	6.40	9.55
29	6.50	......	10.80	9.70	6.60	5.50	5.60	5.00	5.80	9.00	6.65	11.05
30	6.35	......	10.10	8.65	6.30	5.60	5.60	4.95	6.35	8.20	6.65	9.80
31	6.25	......	......	......	6.20	......	5.55	5.00	......	7.20	......	10.25

Current-meter Discharge Measurement of Chenango River at Binghamton, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907. June 20	Wood and Hoyt.............	5.67	290	535	1.21	648

Rating table for Chenango River at Binghamton, N. Y., for 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
4.90	115	6.20	1,360	7.50	3,220	9.60	6,790
5.00	175	6.30	1,490	7.60	3,375	9.80	7,140
5.10	240	6.40	1,625	7.70	3,535	10.00	7,500
5.20	315	6.50	1,760	7.80	3,695	10.20	7,860
5.30	396	6.60	1,900	7.90	3,855	10.40	8,220
5.40	480	6.70	2,040	8.00	4,020	10.60	8,590
5.50	570	6.80	2,180	8.20	4,355	10.80	8,970
5.60	665	6.90	2,325	8.40	4,695	11.00	9,350
5.70	765	7.00	2,470	8.60	5,040	12.00	11,250
5.80	875	7.10	2,615	8.80	5,390	13.00	13,250
5.90	990	7.20	2,765	9.00	5,740	14.00	15,300
6.00	1,110	7.30	2,915	9.20	6,090		
6.10	1,235	7.40	3,065	9.40	6,440		

The above table is applicable only for open-channel conditions. It is based upon discharge measurements made during 1901–1906. It is well defined between gage heights 5.3 feet and 10.0 feet. Above 10.0 feet, it is based on one high-water measurement.

Mean Daily Discharge, Second-feet, of Chenango River at Binghamton, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	12,550	1,300	480	4,270	6,960	1,170	1,240	665	175	1,690	2,180	1,830
2	12,350	1,300	480	3,220	6,960	1,170	1,360	618	145	1,240	1,900	1,690
3	6,960	1,490	396	2,990	4,780	1,300	1,760	665	175	1,110	4,950	1,560
4	10,960	2,250	438	2,620	4,610	1,240	1,110	765	278	1,490	5,650	1,560
5	14,920	1,170	525	2,470	4,020	1,170	932	618	1,110	5,300	4,270	1,110
6	9,350	1,110	396	2,400	3,300	1,240	715	570	1,240	4,100	3,460	1,360
7	6,960	1,360	618	2,180	3,140	1,760	665	480	1,170	3,860	12,550	1,170
8	7,860	1,050	396	1,900	4,360	2,110	570	396	932	6,180	13,980	1,170
9	8,970	932	396	2,250	3,780	2,040	525	356	525	8,680	10,680	1,360
10	6,620	765	438	2,540	3,540	1,900	480	356	875	6,260	8,040	14,280
11	4,700	665	480	2,760	3,140	1,490	454	396	5,920	4,190	5,650	19,500
12	3,860	1,240	480	2,690	2,760	1,170	1,620	396	7,410	4,870	4,520	14,280
13	3,140	990	438	2,760	2,320	1,110	1,760	356	4,780	4,610	3,700	7,860
14	3,140	765	570	2,760	2,180	990	1,490	315	2,040	3,460	3,220	5,650
15	4,020	990	2,540	2,540	1,970	932	990	240	1,620	2,990	2,690	4,87
16	3,300	715	7,770	2,320	2,040	875	820	278	1,240	2,400	2,320	4,440
17	1,760	1,300	8,130	2,400	2,040	875	570	278	1,110	2,110	2,180	3,940
18	1,760	765	8,500	2,400	1,970	765	618	315	875	1,900	1,900	3,460
19	2,320	665	8,780	2,250	1,970	715	665	315	765	1,690	1,970	3,060
20	7,320	1,360	6,000	2,110	2,040	715	665	240	765	1,560	1,900	2,470
21	7,860	665	3,860	1,900	1,760	665	715	278	765	1,900	1,760	2,760
22	3,700	820	4,700	1,690	1,490	715	715	240	1,300	1,900	1,830	2,320
23	1,620	570	11,060	1,690	1,360	715	618	240	1,050	1,620	1,690	4,520
24	1,360	570	12,650	2,840	1,300	665	665	208	1,110	1,420	1,560	15,500
25	1,490	480	10,780	7,320	1,170	570	875	208	1,170	1,240	1,560	14,580
26	1,760	525	8,310	6,180	1,490	438	1,760	175	1,170	1,170	1,620	8,880
27	1,490	570	6,700	11,060	2,250	480	1,560	208	990	1,110	1,620	6,260
28	1,620	480	7,140	7,590	2,540	715	1,170	208	932	2,760	1,620	6,700
29	1,760	......	8,970	6,960	1,900	570	665	175	875	5,740	1,970	9,440
30	1,560	......	7,680	5,130	1,490	665	665	145	1,560	4,360	1,970	7,140
31	1,420	......	......	......	1,360	......	618	175	......	2,760	......	7,950
Mean	5,110	959	4,340	3,470	2,770	1,030	937	351	1,470	3,090	3,830	5,890

Monthly Discharge of Chenango River at Binghamton, N. Y.

[Drainage area, 1,530 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
January	14,920	1,360	5,110	3.41	3.92
February	2,250	480	959	0.627	0.652
March (30 days)	12,650	396	4,340	2.84	3.27
April	11,060	1,690	3,470	2.27	2.54
May	6,960	1,170	2,770	1.81	2.08
June	2,110	438	1,030	0.674	0.755
July	1,760	454	937	0.613	0.705
August	765	145	351	0.230	0.264
September	7,410	145	1,470	0.961	1.08
October	8,680	1,110	3,090	2.02	2.32
November	13,980	1,560	3,830	2.50	2.80
December	19,500	1,110	5,890	3.85	4.43

CHEMUNG RIVER.

DESCRIPTION.

Chemung river is formed at Painted Post, N. Y., by the confluence of Tioga and Cohocton rivers. Cohocton river lies entirely in the state of New York. Tioga river receives, just above its mouth, Canisteo river, a large tributary, which also has its drainage basin in New York to the south of the Cohocton. The drainage area of Tioga river, above the Canisteo, is mainly in Pennsylvania. Chemung river flows southeastward through Corning, Elmira and Chemung, crosses the state line and flows for a short distance in Pennsylvania, then returns to New York, and crosses again to Pennsylvania near Waverly, finally emptying into the Susquehanna near Athens, Bradford county, Pa. The total length of the river is about 40 miles, of which 30 miles lie in New York; the drainage area, measured at the mouth, is 2,520 square miles.

The topographic features of the basin are, as a rule, bold and broad. The hills rise to a height of several hundred feet on either side, within a short distance of the stream. The upland plateau is to a large extent wooded, has impervious soil, no lake storage, and few marsh areas. Tributaries are ramifying and uniformly distributed, though not very numerous, and dry gullies, or flood channels, are common. The main river is sluggish, with low banks and a broad valley or flood plain, which is often overflowed. The concentration of storm waters from the three large streams, which unite just above Corning, makes possible excessive floods. Dikes have been erected in the cities of Elmira and Corning for protection. One of the highest recorded freshets in the stream occurred June 1, 1889. It was preceded by phenomenal rainfall, aggregating several inches in a few hours during the night of May 31. The discharge at this time has been estimated at 67 second-feet per square mile from 2,055 square miles, or 138,000 second-feet.[a]

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[a] Report of Francis Collingwood, C. E., on the protection of the city of Elmira, N. Y., against floods.

CHEMUNG RIVER AT CHEMUNG, N. Y.

The gaging station was established September 7, 1903, by R. E. Horton. It has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the suspension highway bridge, midway between Chemung, N. Y., and Willawana, Pa., near the state line.

The channel is straight for 700 feet above and 800 feet below the station. The right bank is high, cleared, and not subject to overflow; the left bank is of medium height, wooded, and will overflow at high water. The bed of the stream is composed of gravel and is clean and permanent. The current is good. There is but one channel at all stages.

Discharge measurements are made from the down-stream side of the bridge, which has a single span of 395 feet. The initial point for soundings is the face of the right abutment on the down-stream side.

A standard chain gage is attached to the up-stream side of the bridge, near the right bank, and is read twice each day by Daniel L. Orcutt. The bench-mark is formed by three nails driven into a telephone pole 70 feet to the right of the initial point for soundings and about 30 feet up-stream. The pole is marked with black paint "U. S. G. S. B. M." Elevation of bench-mark is assumed at 100.00. The elevation of water-surface, when the gage reads zero, is 70.12.

The smooth water reaches of the stream become ice-covered in winter. Needle ice forms over the rapids and is carried under the surface ice. Much of the winter flow apparently filters through these beds of needle ice at times. The conditions render the estimation of the daily discharge in winter impracticable.

Mean Daily Gage Height, in Feet, of Chemung River at Chemung, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	6.72	3.97	......	4.50	5.85	2.84	2.12	1.98	1.58	2.92	2.93	3.03
2	6.12	3.46	......	4.14	5.29	2.84	4.25	1.94	1.66	2.56	2.87	2.92
3	5.20	3.08	......	3.84	4.82	4.78	3.85	1.96	1.66	2.85	5.56	2.80
4	6.02	5.48	......	3.78	4.32	4.00	3.26	1.88	1.72	2.32	5.11	2.70
5	7.43	4.83	......	3.60	4.52	3.60	2.44	1.86	1.80	3.11	4.26	2.52
6	5.56	4.32	......	3.54	4.18	4.11	2.74	1.95	2.12	3.22	3.91	2.58
7	5.31	4.20	......	3.38	4.00	4.02	3.15	1.88	1.90	2.86	6.58	2.50
8	7.36	3.94	......	3.34	4.90	3.58	3.14	1.91	1.84	2.60	6.96	2.60
9	8.71	3.83	......	3.25	5.09	3.30	2.86	1.84	1.83	3.46	5.58	2.72
10	6.30	3.60	......	3.42	5.00	3.10	2.82	1.88	1.82	3.63	4.98	4.08
11	5.45	3.49	......	3.56	4.42	2.88	2.72	1.84	2.03	2.52	4.48	7.18
12	4.91	4.24	......	3.98	4.42	2.90	3.48	1.78	2.11	2.92	4.16	5.82
13	4.69	......	......	4.26	4.15	2.76	4.60	1.78	2.20	3.10	3.82	4.64
14	4.79	......		4.23	3.92	2.76	3.55	1.76	2.14	2.90	3.60	4.34
15	6.66	......	7.98	4.07	3.58	2.82	3.07	1.70	2.01	2.76	3.32	4.03
16	4.12	......	6.28	3.81	3.48	2.81	2.78	1.66	1.88	2.62	3.13	4.11
17	4.28	......	6.82	3.69	3.76	2.58	2.71	1.65	1.85	2.53	3.06	3.96
18	3.88	......	6.74	3.79	3.56	2.54	2.82	1.65	1.82	2.36	2.99	3.74
19	4.61	......	6.10	3.62	3.43	2.48	2.56	1.56	1.78	2.28	2.98	3.55
20	7.08	......	5.43	3.54	3.64	2.39	2.51	1.62	1.86	2.31	3.04	3.25
21	7.62	......	5.44	3.54	3.52	2.46	2.38	1.62	1.90	2.31	2.83	3.38
22	5.14	......	5.28	3.33	3.29	2.58	2.36	1.63	1.82	2.40	3.10	3.05
23	4.24	......	8.08	3.24	3.22	2.60	2.20	1.63	1.92	2.50	3.12	4.30
24	3.44	......	7.40	6.70	3.04	2.48	2.20	1.66	1.80	2.47	2.98	12.12
25	3.52	......	6.48	7.17	2.99	2.85	2.31	1.62	1.88	2.27	2.93	8.53
26	3.83	......	5.56	6.86	2.46	2.94	2.18	1.60	1.86	2.25	2.86	6.57
27	3.54	......	5.33	10.14	3.25	2.82	2.22	1.58	1.79	2.15	2.38	5.80
28	3.66	......	6.35	7.32	3.57	2.65	2.05	1.61	1.75	2.46	2.92	7.00
29	3.61	......	6.58	6.17	3.42	2.51	2.19	1.57	1.74	4.11	3.05	8.20
30	3.50	......	5.86	5.40	3.10	2.68	1.48	1.58	1.93	3.70	3.15	6.50
31	4.59	......	5.08	......	2.98	......	1.93	1.60	......	3.24	......	6.68

Current-meter Discharge Measurements of Chemung River at Chemung, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907. June 19	Wood and Hoyt	2.50	2.15	974	0.64	627

Rating table for Chemung River at Chemung, N. Y., for 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1.50	85	3.10	1,110	4.70	3,610	7.20	9,790
1.60	115	3.20	1,220	4.80	3,820	7.40	10,390
1.70	145	3.30	1,335	4.90	4,030	7.60	11,010
1.80	180	3.40	1,455	5.00	4,240	7.80	11,650
1.90	220	3.50	1,580	5.10	4,460	8.00	12,300
2.00	270	3.60	1,710	5.20	4,680	8.20	12,970
2.10	325	3.70	1,850	5.30	4,900	8.40	13,650
2.20	385	3.80	2,000	5.40	5,130	8.60	14,350
2.30	450	3.90	2,160	5.60	5,590	8.80	15,070
2.40	515	4.00	2,320	5.80	6,060	9.00	15,800
2.50	585	4.10	2,480	6.00	6,550	10.00	19,700
2.60	660	4.20	2,650	6.20	7,070	11.00	24,000
2.70	740	4.30	2,830	6.40	7,590	12.00	28,700
2.80	825	4.40	3,010	6.60	8,130	13.00	33,500
2.90	915	4.50	3,200	6.80	8,670	14.00	39,300
3.00	1,010	4.60	3,400	7.00	9,220		

The above table is applicable only for open-channel conditions. It is based upon discharge measurements made during 1903-1906. It is well defined between gage heights 1.9 feet and 12.0 feet.

Mean Daily Discharge, Second-feet, of Chemung River at Chemung, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	*a*	*a*	*a*	3,200	6,180	870	340	258	108	939	939	1,040
2	*a*	*a*	*a*	2,560	4,900	870	2,740	245	130	622	892	939
3	*a*	*a*	*a*	2,080	3,870	3,770	2,080	245	130	482	5,480	825
4	*a*	*a*	*a*	1,960	2,880	2,320	2,080	210	154	466	4,460	740
5	*a*	*a*	*a*	1,710	3,250	1,710	550	200	180	1,110	2,740	604
6	*a*	*a*	*a*	1,640	2,610	2,480	782	245	340	1,250	2,160	641
7	*a*	*a*	*a*	1,420	2,320	2,360	1,160	210	220	870	8,060	585
8	*a*	*a*	*a*	1,400	4,030	1,680	1,160	220	200	660	9,080	660
9	*a*	*a*	*a*	1,280	4,460	1,340	870	200	190	1,520	5,530	761
10	*a*	*a*	*a*	1,490	4,240	1,110	848	210	190	1,740	4,190	2,440
11	*a*	*a*	*a*	1,640	3,060	892	761	200	284	604	3,150	9,720
12	*a*	*a*	*a*	2,280	3,060	915	1,550	171	325	939	2,560	6,120
13	*a*	*a*	*a*	2,740	2,560	782	3,400	171	385	1,110	2,040	3,500
14	*a*	*a*	*a*	2,700	2,200	782	1,640	162	355	915	1,710	2,920
15	*a*	*a*	12,220	2,440	1,680	848	1,080	145	270	804	1,360	2,360
16	*a*	*a*	7,260	2,000	1,550	825	804	130	210	680	1,140	2,480
17	*a*	*a*	8,740	1,850	1,920	641	740	130	200	604	1,060	2,240
18	*a*	*a*	8,540	2,000	1,640	622	848	130	190	482	1,010	1,920
19	*a*	*a*	6,810	1,740	1,490	568	622	100	171	434	986	1,640
20	*a*	*a*	5,190	1,640	1,780	515	585	122	200	450	1,060	1,280
21	*a*	*a*	5,240	1,640	1,610	550	499	122	220	450	848	1,420
22	*a*	*a*	4,850	1,360	1,340	641	482	122	190	515	1,110	1,060
23	*a*	*a*	12,560	1,280	1,250	660	385	122	232	585	1,140	2,830
24	*a*	*a*	10,390	8,400	1,060	568	385	130	180	568	986	29,300
25	*a*	*a*	7,790	9,720	1,010	870	450	122	210	434	939	14,140
26	*a*	*a*	5,480	8,810	550	962	370	115	200	418	870	8,060
27	*a*	*a*	4,960	20,740	1,280	848	401	108	180	355	499	6,060
28	*a*	*a*	7,460	10,160	1,680	700	298	115	162	550	939	9,220
29	*a*	......	8,060	7,000	1,490	585	385	108	162	2,480	1,060	13,000
30	*a*	......	6,180	5,130	1,110	720	85	108	232	1,850	1,160	7,860
31	*a*	......	4,400	......	986	......	232	115	......	1,280	......	8,330
Mean	......	......	7,420	3,800	2,360	1,100	923	161	213	844	2,300	4,670

a Ice obstruction.

Monthly Discharge of Chemung River at Chemung, N. Y.

[Drainage area, 2,440 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
March 15-31 (17 days)	12,560	4,400	7,420	3.04	3.50
April	20,740	1,280	3,800	1.56	1.75
May	6,180	550	2,360	0.968	1.113
June	3,770	515	1,100	0.451	0.505
July	3,400	85	923	0.378	0.435
August	258	100	161	0.066	0.076
September	385	108	213	0.087	0.097
October	2,480	355	844	0.346	0.398
November	9,080	499	2,300	0.943	1.06
December	29,300	585	4,670	1.91	2.20

ALLEGHENY RIVER DRAINAGE BASIN.

DESCRIPTION OF ALLEGHENY RIVER.

Allegheny river, which, with the Monongahela, forms the Ohio at Pittsburg, rises in northern Pennsylvania, flows north into the state of New York, then flows south through western Pennsylvania. The headwaters have an elevation of about 2,500 feet and join those of Genesee river on the north and of the Susquehanna on the east. The total length from the source to the mouth at Pittsburg is about 300 miles, 47 of which are in the state of New York. The principal facts concerning this river have been given in a report by George Lehman, assistant engineer, contained in House Document No. 72, Fifty-fifth Congress, third session. Although this river drains a large area, much of which is of an elevated and even mountainous character, yet it is of comparatively small value for water-power. The total fall in 255 miles, between Olean, N. Y., and the mouth, is only 725 feet, or an average of less than 3 feet per mile. This descent is accomplished without abrupt pitches, and even with few rapids having a fall of much consequence. The drainage basin of Allegheny river above Red House is comparatively rugged and precipitous. It is mostly covered with brush and light forest. A considerable amount of snow accumulates in the winter and feeds the stream until late in spring. The basin is underlain by shales of the Chemung series, and the depth of soil is usually small, excepting in stream valleys. There are no lakes and no artificial storage tributary to the stream. The Cuba reservoir, which feeds the Erie canal through Genesee river, lies on the divide between the Allegheny and Genesee drainage basins. A part of the overflow from this reservoir passes into the Allegheny, the rest passes into Genesee river. During about half of the year the river is navigable for small steamers to Franklin, 123 miles above Pittsburg.

ALLEGHENY RIVER AT RED HOUSE, N. Y.

This station was established September 4, 1903, by R. E. Horton. It has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the Red House bridge, near the stations of the Erie and Pennsylvania railroads and about 5 miles below Salamanca, N. Y., about 13 miles above the point where the river leaves New York state. At Olean, N. Y., the wasteway from the Cuba reservoir enters the stream through Olean creek. This reservoir is located on the divide between Oil creek, tributary to Allegheny river, and Genesee river. The storage is commonly turned into Genesee river through the abandoned summit level of Genesee Valley canal, but may be diverted into Oil creek through the guard-lock at the head of the canal.

The channel is straight for 800 feet above and below the station, 494 feet wide between abutments, broken by two piers. The current velocity is well distributed. The right bank is high and does not overflow. The left bank overflows only at flood stages. At extreme high water there is an additional flood channel on the left bank. The bed is of gravel and is regular.

Discharge measurements are made from the down-stream side of the bridge. The initial point for soundings is the left end of the down-stream side of the bridge.

A standard chain gage is fastened to the up-stream side of the bridge near the middle of the left span; length of chain, 24.16 feet. The gage is read twice each day by G. H. Smith. The bench-mark is a circle cut on the down-stream side of the left abutment; assumed elevation, 100.00. The elevation of water-surface, when the gage reads zero, is 78.91.

Mean Daily Gage Height, in Feet, of Allegheny River at Red House, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	a	a	a	6.4	5.8	4.4	5.5	3.2	2.7	3.2	3.6	3.8
2	a	a	a	5.7	5.6	5.15	5.5	3.2	2.7	3.1	3.6	3.8
3	a	a	a	5.3	5.2	6.1	5.3	3.2	2.8	3.0	3.5	3.7
4	a	a	a	5.0	6.1	5.5	5.0	3.2	2.8	5.0	5.2	3.6
5	a	a	a	5.0	6.5	5.4	4.5	3.1	2.9	4.5	5.0	3.5
6	a	a	a	4.8	5.8	6.6	4.3	3.0	2.8	3.9	4.7	3.4
7	a	a	a	4.6	5.4	6.3	4.2	3.0	2.8	4.9	4.5	3.4
8	a	a	a	4.5	6.2	5.5	4.1	3.0	2.9	5.5	5.4	3.3
9	a	a	a	4.6	6.0	5.1	3.9	3.0	2.8	5.0	5.3	3.5
10	a	a	a	4.5	5.6	4.8	3.8	3.0	2.8	5.2	4.8	3.7
11	a	a	a	4.5	5.3	4.6	3.6	2.9	3.0	5.2	4.7	5.0
12	a	a	a	4.5	5.1	4.4	5.95	2.9	3.3	4.9	4.5	5.6
13	a	a	a	4.6	4.9	4.2	5.60	2.9	3.2	4.8	4.3	5.4
14	a	a	a	4.6	4.6	4.2	4.5	2.9	3.1	4.7	4.2	5.3
15	a	a	7.1	4.5	4.4	4.2	4.1	2.8	3.0	4.5	3.9	5.2
16	a	a	7.15	4.4	4.6	3.9	3.9	2.8	2.9	4.5	3.8	4.8
17	a	a	7.55	4.4	4.7	3.8	3.8	2.8	2.9	4.8	3.8	4.7
18	a	a	7.8	4.3	4.6	3.7	3.8	2.8	2.9	4.7	3.7	4.3
19	a	a	7.6	4.2	4.6	3.7	3.6	2.8	3.0	4.5	3.8	4.2
20	a	a	7.9	4.2	5.5	3.7	3.5	2.8	3.0	4.4	3.7	4.2
21	a	a	7.5	4.1	5.6	3.7	3.4	2.9	3.1	5.0	3.7	4.0
22	a	a	7.1	4.0	5.3	3.7	3.4	2.8	3.0	4.9	3.6	4.5
23	a	a	7.7	3.9	5.0	4.4	3.3	2.8	3.0	4.7	3.7	5.6
24	a	a	7.7	6.85	4.7	5.1	3.3	2.8	3.0	4.3	3.7	5.5
25	a	a	7.4	7.3	4.5	5.0	3.3	2.8	3.0	4.0	3.6	5.0
26	a	a	7.1	7.4	4.4	5.0	3.3	2.8	2.9	3.8	3.5	4.8
27	a	a	7.5	7.7	5.6	4.6	3.5	2.8	2.9	3.6	3.6	5.6
28	a	a	8.35	7.1	5.9	4.3	3.4	2.8	2.9	4.0	3.7	7.9
29	a	a	7.95	6.6	5.3	4.1	3.2	2.7	3.5	3.8	3.8	7.5
30	a	a	7.35	6.2	4.9	4.2	3.2	2.7	3.4	3.9	4.0	7.2
31	a	a	6.8	......	4.6	......	3.1	2.7	......	3.7	......	6.8
	a											

a Ice obstruction.

Current-meter Discharge Measurements of Allegheny River at Red House, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907. Mar. 16	C. C. Covert	7.00	366	2,390	3.76	8,970

Rating table for Allegheny River at Red House, N. Y., from September 4, 1903, to December 31, 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
2.70	195	4.00	1,471	5.30	3,820	7.20	9,400
2.80	260	4.10	1,605	5.40	4,065	7.40	10,080
2.90	328	4.20	1,745	5.50	4,315	7.60	10,790
3.00	400	4.30	1,891	5.60	4,570	7.80	11,530
3.10	478	4.40	2,043	5.70	4,830	8.00	12,300
3.20	564	4.50	2,200	5.80	5,100	8.20	13,120
3.30	658	4.60	2,365	5.90	5,375	8.40	13,960
3.40	759	4.70	2,540	6.00	5,660	8.60	14,800
3.50	866	4.80	2,725	6.20	6,245	8.80	15,660
3.60	978	4.90	2,920	6.40	6,845	9.00	16,540
3.70	1,095	5.00	3,130	6.60	7,460	10.00	21,100
3.80	1,216	5.10	3,350	6.80	8,090	11.00	26,200
3.90	1,341	5.20	3,580	7.00	8,740	12.00	31,800

The above table is applicable only for open-channel conditions. It is based upon 20 discharge measurements made during 1903–1906. It is well defined between gage heights 3.1 feet and 10.0 feet.

Mean Daily Discharge, Second-feet, of Allegheny River at Red House, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	*a*	*a*	*a*	6,840	5,100	2,040	4,320	564	195	564	978	1,220
2	*a*	*a*	*a*	4,830	4,570	3,460	4,320	564	195	478	978	1,220
3	*a*	*a*	*a*	3,820	3,580	5,950	3,820	564	260	400	866	1,100
4	*a*	*a*	*a*	3,130	5,950	4,320	3,130	564	260	3,130	3,580	978
5	*a*	*a*	*a*	3,130	7,150	4,060	2,200	478	328	2,200	3,130	866
6	*a*	*a*	*a*	2,720	5,100	7,460	1,890	400	260	1,340	2,540	759
7	*a*	*a*	*a*	2,360	4,060	6,540	1,740	400	260	2,920	2,200	759
8	*a*	*a*	*a*	2,200	6,240	4,320	1,600	400	328	4,320	4,060	658
9	*a*	*a*	*a*	2,360	5,660	3,350	1,340	400	260	3,130	3,820	866
10	*a*	*a*	*a*	2,200	4,570	2,720	1,220	400	260	3,580	2,720	1,100
11	*a*	*a*	*a*	2,200	3,820	2,360	978	328	400	3,580	2,540	3,130
12	*a*	*a*	*a*	2,200	3,350	2,040	5,520	328	658	2,920	2,200	4,570
13	*a*	*a*	*a*	2,360	2,920	1,740	4,570	328	564	2,720	1,890	4,060
14	*a*	*a*	*a*	2,360	2,360	1,740	2,200	328	478	2,540	1,740	3,820
15	*a*	*a*	9,070	2,200	2,040	1,740	1,600	260	400	2,200	1,340	3,580
16	*a*	*a*	9,240	2,040	2,360	1,340	1,340	260	328	2,200	1,220	2,720
17	*a*	*a*	10,610	2,040	2,540	1,220	1,220	260	328	2,720	1,220	2,540
18	*a*	*a*	11,530	1,890	2,360	1,100	1,220	260	328	2,540	1,100	1,890
19	*a*	*a*	10,790	1,740	2,360	1,100	978	260	400	2,200	1,220	1,740
20	*a*	*a*	11,920	1,740	4,320	1,100	866	260	400	2,040	1,100	1,740
21	*a*	*a*	10,440	1,600	4,570	1,100	759	328	478	3,130	1,100	1,470
22	*a*	*a*	9,070	1,470	3,820	1,100	759	260	400	2,920	978	2,200
23	*a*	*a*	11,160	1,340	3,130	2,040	658	260	400	2,540	1,100	4,570
24	*a*	*a*	11,160	8,250	2,540	3,350	658	260	400	1,890	1,100	4,320
25	*a*	*a*	10,080	9,740	2,200	3,130	658	260	400	1,470	978	3,130
26	*a*	*a*	9,070	10,080	2,040	3,130	658	260	328	1,220	866	2,720
27	*a*	*a*	10,440	11,160	4,570	2,360	866	260	328	978	978	4,570
28	*a*	*a*	13,750	9,070	5,380	1,890	759	260	328	1,470	1,100	11,920
29	*a*	.....	12,110	7,460	3,820	1,600	564	195	866	1,220	1,220	10,440
30	*a*	.....	9,910	6,240	2,920	1,740	564	195	759	1,220	1,470	9,400
31	*a*	.....	8,090	.....	2,360	.....	478	195	.....	1,100	.....	8,090
Mean	.....	.....	10,500	4,030	3,800	2,700	1,720	334	388	2,160	1,710	3,300

a Ice obstruction.

Monthly Discharge of Allegheny River at Red House, N. Y.

[Drainage area, 1,640 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1907.					
March (17 days)	13,750	8,090	10,500	6.40	7.36
April	11,160	1,340	4,030	2.46	2.76
May	7,150	2,040	3,800	2.32	2.67
June	7,460	1,100	2,700	1.65	1.85
July	5,520	478	1,720	1.05	1.21
August	564	195	334	0.204	0.235
September	866	195	388	0.237	0.265
October	4,320	400	2,160	1.32	1.52
November	4,060	866	1,710	1.04	1.16
December	11,920	658	3,300	2.01	2.31

GAGINGS OF CANALS AND FEEDERS.

Current-meter measurements have been made to determine the flow in the existing State canals and feeders during the navigation season of 1907, as described below:

ROCHESTER–LOCKPORT LEVEL OF ERIE CANAL.

Erie canal from the foot of the locks at Lockport to Lock No. 66 at Rochester has a length of 59.55 miles. This portion of the canal derives its water-supply chiefly from Lake Erie and this level has a surface slope sufficient to carry the requisite feed water. The line of the canal from Rochester to Lockport is crossed by numerous small streams, most of which pass underneath the canal prism through culverts. Waste-weirs are located at a number of these stream crossings. In addition, provision is made for the permanent waste of water, which is utilized for power development at Albion, Medina and Lockport. In order to determine the amount of this diversion and the necessary water-supply for this level, a series of current-meter measurements have been made, the results of which are given in the following tables.

West branch of Sandy creek, which crosses the canal at Albion, was measured at a highway bridge located about one mile down-stream from the canal crossing.

Oak Orchard creek, which crosses the canal at Medina, was measured at a highway bridge three miles north of Medina.

Eighteen-Mile creek, which receives the diversion from the Erie canal at Lockport, was measured at highway bridge one mile northwest of the canal crossing and just above the entrance of the Gulf tributary.

Measurements of the flow in the canal prism were made a short distance up-stream and down-stream from each of the points of diversion.

No measurements of the flow in the streams which receive the diversion were made above the canal crossing. The ordinary and low-water flow of these streams is small. The results of gagings of Oak Orchard creek above Medina may be found in the State Engineer and Surveyor's Report for 1903, Supplement, pages 54–59.

Current-meter Discharge Measurements of Flow in Erie Canal and Eighteen-Mile Creek at Lockport, N. Y.

DATE.	Hydrographer.	ERIE CANAL.				EIGHTEEN-MILE CREEK.	
		ABOVE LOCKS.		BELOW LOCKS.			
		Stage.*a*	Discharge.	Stage.*b*	Discharge.	Stage.*c*	Discharge.
		Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1907.							
May 1..	Horton and Niles...	......	......	2.2	699	......	....
May 2..	Horton and Niles...	4.4	870	......	......	7.18	181
May 24..	E. C. Niles.........	5.7	966	2.15	589	7.1	200
June 21..	E. C. Niles.........	5.35	1,073	2.2	747	7.0	287
July 29..	E. C. Niles.........	4.85	820	2.4	667	7.55	156
Aug. 14..	E. C. Niles.........	5.95	941	2.3	725	6.9	285
Aug. 26..	E. C. Niles.........	5.8	993	2.3	654	7.2	235
Sept. 24..	E. C. Niles.........	5.4	1,036	2.2	834	7.1	239
Nov. 25..	E. C. Niles.........	5.6	894	2.35	690	7.1	274
1900.							
September	E. Kuichling.......	......	808	......	612	......	....

a Distance from reference point to water-surface; reference point is arrow on top of waling of tow-path under up-stream side of bridge.

b Distance to water-surface from reference point, which is arrow on top of waling of tow-path under down-stream side of bridge.

c Distance to water-surface from reference point, which is arrow on top of tiebar, left-hand end of bridge, down-stream side.

Current-meter Discharge Measurements of Flow in Erie Canal and Oak Orchard Creek a Medina, N. Y.

DATE.	Hydrographer.	ERIE CANAL.				OAK ORCHARD CREEK BELOW CANAL.	
		EAST OF MEDINA.		WEST OF MEDINA.			
		Stage.*a*	Discharge.	Stage.*b*	Discharge.	Stage.*c*	Discharge.
		Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1907.							
May 1	Horton and Niles....	2.9	477	*d*1.15	612	8.1	215
May 23	E. C. Niles..........	2.8	514	3.2	584	8.25	233
June 20	E. C. Niles..........	2.88	480	3.25	582	8.3	222
July 27	E. C. Niles..........	2.9	570	3.4	597	8.1	*e*133
Aug. 14	E. C. Niles..........	2.8	489	3.25	617	7.1	*e*216
Aug. 26	E. C. Niles..........	2.7	510	3.15	646	7.4	*e*138
Sept. 24	E. C. Niles..........	2.9	441	3.4	632	7.65	*e*259
Nov. 25	E. C. Niles..........	2.8	389	3.3	468	8.3	*e*191

a, *b*, *c* Distance to water-surface from a reference point, which is: *a* Coping of wall under left-hand end, down-stream side of bridge; *b* Arrow on coping of wall under left-hand end, down-stream side of bridge; *c* Outer tiebar, down-stream side of bridge, left-hand end.

d Measurement made at Middleport.

e Grass obstruction.

Current-meter Discharge Measurements of Flow in Erie Canal and West Branch of Sand Creek at Albion, N. Y.

DATE.	Hydrographer.	ERIE CANAL.				WEST BRANCH SANDY CREEK BELOW CANAL.	
		EAST OF ALBION.		WEST OF ALBION.			
		Stage.*a*	Discharge.	Stage.*b*	Discharge.	Stage.*c*	Discharge.
		Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1907.							
April 30	Horton and Niles....	......	......	......	......	5.9	103
May 22	E. C. Niles..........	2.35	264	......	......	5.9	90.7
May 23	E. C. Niles..........	......	......	2.45	427	......	....
May 22	E. C. Niles..........	......	......	......	......	......	....
June 19	E. C. Niles..........	2.3	404	2.4	503	6.1	75.6
July 27	E. C. Niles..........	2.45	439	2.5	528	5.9	*d*85.5
Aug. 13	E. C. Niles..........	2.5	378	2.5	533	5.6	93.3
Aug. 26	E. C. Niles..........	2.25	379	2.3	485	5.9	44.3
Sept. 23	E. C. Niles..........	2.25	311	2.3	391	6.1	43.4
Nov. 23	E. C. Niles..........	2.25	390	2.3	473	6.0	67.9

a Distance to water-surface from a reference point, which is an arrow painted on tow-path vertical wall, left-hand, down-stream side of bridge.

b Distance to water-surface from reference point—point of arrow, tow-path vertical wall, left-hand, down-stream side of bridge.

c Distance to water-surface from reference point—arrow on top of coping, bridge-seat, up-stream side, left-hand abutment.

d Water full of slimy substance from pea canning factory, which clogged meter continually.

Current-meter Discharge Measurements of Flow in Erie Canal at Rochester, N. Y.

DATE.	Hydrographer.	ERIE CANAL.			
		WEST OF AQUEDUCT.		EAST OF AQUEDUCT.	
		Stage.*a*	Discharge.	Stage.*b*	Discharge.
		Feet.	*Second-feet.*	*Feet.*	*Second-feet.*
1907.					
April 29	Horton and Niles............	0.68 *c*	438 *c*	....	....
May 3	E. C. Niles.................	2.65	352	1.62	187
May 22	E. C. Niles.................	2.55	232	1.8	392
June 19	E. C. Niles.................	4.55	159	1.98	437
July 26	E. C. Niles.................	2.4	343	1.6	217
Aug. 12	E. C. Niles.................	2.35	143	1.45	184
Aug. 28	E. C. Niles.................	3.05	270	2.15	188
Sept. 23	E. C. Niles.................	2.98	282	2.3	486
Nov. 23	E. C. Niles.................	2.6	317	1.65	250

a Distance to water-surface from a reference point, which is arrow on lower right-hand corner of I-beam, left-hand, down-stream side of lift-bridge.

b Distance to water-surface from a reference point which is crack between concrete blocks of vertical wall, directly under hand-railing, left-hand, down-stream side of bridge.

c This measurement made at Farm bridge 88, first bridge west of Rochester. Reference point, end of 12-inch waling under up-stream left-hand end of bridge.

Utica–Syracuse Level of Erie Canal.

From Schuyler street lock, Utica, to the upper lock at Syracuse, a distance of 55.94 miles, the Erie canal forms a single summit level at elevation 429.6. This level receives several important feeders. Proceeding from east to west these are Oriskany feeder at Oriskany; Black River canal and Mohawk river feeder at Rome; Chittenango feeder at Chittenango; Limestone creek feeder near Fayetteville, and Orrville feeder from Butternut creek at Orrville.

It is intended to retain this level of the canal, in conjunction with the various feeders, as one source of water-supply for the Barge canal. In order to determine the water-supply available from these sources, gaging stations have been established on the principal tributary streams, as described in this report. In addition, several measurements of the flow of the canal at the eastern and western ends of this level were made during the navigation season of 1907, as listed below.

Current-meter Discharge Measurements of Erie Canal (Catharine and Almond Streets), Syracuse, N. Y.

DATE.	Hydrographer.	Meter number.	Area of section.	Mean velocity.	Discharge.
			Square feet.	*Feet per second.*	*Second-feet.*
1907.					
May 21	Weeks and Niles	462	614.5	......	183
July 25	E. C. Niles	360	561.0	......	107

Current-meter Discharge Measurements of Erie Canal at Hedson's Landing, east of Syracuse, N. Y.

DATE.	Hydrographer.	Meter number.	Area of section.	Mean velocity.	Discharge.
			Square feet.	*Feet per second.*	*Second-feet.*
1907.					
May 21	E. C. Niles	360	473.8	......	60.5
June 7	E. C. Niles	360	466.5	......	52.7
July 25	E. C. Niles	360	516.0	......	69.9
Nov. 26	E. C. Niles	360	538.6	......	69.8

Current-meter Discharge Measurements of Flow in Erie Canal at Rome, N. Y.

DATE.	Hydrographer.	ERIE CANAL.					
		EAST OF ROME.		WEST OF ROME.		JAY ST.	
		Stage.[a]	Discharge.	Stage.[b]	Discharge.	Stage.[c]	Discharge.
1907.		*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
May 20	E. F. Weeks	......	......	......	......	2.92	140
May 20	Horton and Weeks	......	......	14.5	138	......	....
June 8	E. C. Niles	3.25	256	13.5	6.5	......	....
July 9	Weeks and Niles	3.0	347	......	......	......	....
July 8	Weeks and Niles	......	......	14.4	94.0	......	....
July 25	E. C. Niles	......	......	14.3	50.4	......	....
Aug. 20	E. C. Niles	3.5	134	[d]0.55	52.2	......	....
Sept. 20	E. C. Niles	3.3	119	0.75	98.0	......	....
Nov. 27	E. C. Niles	3.3	291	0.55	41.5	......	....

[a] Distance to water-surface from a reference point, which is arrow painted on retaining wall, under tow-path, down-stream end of bridge.

[b] Distance to water-surface from a reference point, which is top of floor of bridge, upstream side, Sta. " O."

[c] Distance to water-surface from a reference point, which is waling under right-hand, upstream side of bridge.

[d] Distance to water-surface from new reference point, which is nail projecting from endboard used as upstream side of 8" drain culvert running under tow-path about 20 feet upstream from bridge.

Current-meter Discharge Measurements of Erie Canal at Stanwix High Bridge.

DATE.	Hydrographer.	Meter number.	Area of section.	Discharge.
			Square feet.	*Second-feet.*
May 20	E. C. Niles	360	452.3	346

Current-meter Discharge Measurements of Oriskany Feeder at Oriskany, N. Y.

DATE.	Hydrographer.	Meter number.	Area of section.	Discharge.
1907.			*Square feet.*	*Second-feet.*
May 20	Horton and Niles	360	83.6	13.4
June 8	E. C. Niles	360	85.5	14.1
June 12	E. C. Niles	360	85.1	48.1
July 9	Weeks and Niles	462	....	0.0
Aug. 23	E. C. Niles	360	74.6	58.3

BLACK RIVER CANAL AND FEEDER AT BOONVILLE, N. Y.

A portion of the water-supply of the summit level of Erie canal is derived from the headwaters of Black river through a feeder having its intake at the State dam at Forestport and delivering its flow to the summit level of Black River canal at Boonville. A portion of this flow passes northward, supplying the Black River canal from Boonville to the head of slack-water navigation of Black river at the foot of Lyons falls. The remaining flow passes southward through Black River canal, which enters Erie canal at Rome. A portion of this diversion is wasted into the Mohawk river and, in addition, water is diverted from Mohawk river into the Black River canal through the Delta feeder. During low-water periods the entire southward diversion from Black river, together with the entire yield of Mohawk river above Rome, is taken into the Erie canal at Rome, through Black River canal and the feeder located at Rome State dam. In order to determine the amount of diversion and water-supply available from the Forestport feeder, current-meter measurements were made during 1907 in the Forestport feeder at a farm bridge near Sperry Hill, one mile northeast from Boonville. Measurements of northward flow in Black River canal were made at a farm bridge one-half mile north of Boonville and measurements of the southward flow at a farm bridge about three-quarters mile southeast from Boonville.

Current-meter Discharge Measurements of Flow in Black River Canal and Forestport Feeder at Boonville, N. Y.

DATE.	Hydrographer.	BLACK RIVER CANAL.				FORESTPORT FEEDER.	
		NORTH OF BOONVILLE.		SOUTH OF BOONVILLE.			
		Stage*a*.	Discharge.	Stage*b*.	Discharge.	Stage.*c*	Discharge.
		Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1907.							
June 10..	Horton and Niles....	1.26	65.8	1.42	253	4′ 3½″	367
July 24..	E. C. Niles..........	1.27	53.0	1.55	253	4′ 2¼″	288
Aug. 21..	E. C. Niles..........	2.5	30.2	1.55	195	4′ 2½″	268

a Distance to water-surface from a reference point, which is top of mud sill of bent or abutment, left-hand, up-stream side of bridge.

b Distance to water-surface from a reference point, which is top of mud sill of bent or abutment, right-hand, down-stream side of bridge.

c Reading on gage, graduated to feet and inches, left-hand, up-stream side of bridge.

Current-meter Discharge Measurements of Stream running from Canal at Boonville, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Dis-charge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second feet.*
1907.						
July 24...	E. C. Niles..................	......	......	5.0	......	67.8

ROCKY RIFT FEEDER AT INDIAN CASTLE.

Current-meter measurements are made to determine the diversion from Mohawk river for Erie canal through Five-mile, or Rocky Rift feeder at Lansing farm bridge, as listed below. A series of measurements was also made to determine the flow in Erie canal above and below the entrance of the Rocky Rift and Little Falls feeders.

Current-meter Discharge Measurements of Rocky Rift Feeder near Indian Castle.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Dis-charge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1907.						
May 14..	E. C. Niles..................	......	......	112	......	280
May 24..	Horton and Weeks...........	......	......	109	......	272
June 11..	E. C. Niles..................	......	......	94.2	......	266
July 23..	E. C. Niles..................	......	......	125	......	299
Aug. 22..	E. C. Niles..................	......	......	121	......	272
Oct. 26..	E. C. Niles..................	......	......	113	......	274
Nov. 5..	E. C. Niles..................	......	......	111	......	282
Nov. 15..	Niles and Quinn.............	......	......	105	......	267
Nov. 16..	Niles and Quinn.............	......	......	108	......	253

KING'S CANAL AT WATERFORD, N. Y.

King's canal, or King's ditch, is a water-power head-race, which derives its water-supply from a dam near the head of the fourth branch, or sprout of the Mohawk river at Waterford. This is the most northerly of the fan-shaped group of outlets, through which Mohawk river debouches into the Hudson river. Current-meter measurements are made at the uppermost bridge crossing the power canal above the intakes of all the mills. Two gages, one located in King's canal near the down-stream end and the other located in the Mohawk river below the mills, have been read twice each day by this Department.

Current-meter Discharge Measurements of Flow in King's Canal at Waterford, N. Y.

DATE.	Hydrographer.	KING'S CANAL.			
		ABOVE MILLS.		2D BRIDGE BELOW GILBERT PAPER MILL.	
		Stage.[a]	Discharge.	Stage.[b]	Discharge.
		Feet.	*Second-feet.*	*Feet.*	*Second-feet.*
1907.					
May 13...	Horton and Weeks..........	2.94	510	....	....
May 28...	Weeks and Niles............	2.9	588	1.0	399
Aug. 7...	Weeks and Quinn...........	5.1	504	2.05	367

[a] Distance to water surface from a reference point, which is truss timber, right-hand, down-stream side of bridge.

[b] Distance to water-surface from a reference point, which is top board of drain, left-hand down-stream side of bridge.

Measurements of Schoharie creek feeder may be found on page 488, and those of Little Falls feeder on page 300.

The foregoing tables give the data available at the time of submitting this report.

Respectfully,

ROBERT E. HORTON,
Resident Engineer.

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